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JUNE 9, 1986

CHEMICAL & ENGINEERING

NEWS

Facts & Figures

for the chemical industry Page 32

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News of the Week

■ **OMB sets fixed allowance of 3% of research costs for academic overhead in federally funded research.** **Page 6**

■ **FDA approves U.S. marketing of alpha interferon for combating hairy cell leukemia.** **Page 7**

■ **ACS president George Pimentel receives Robert A. Welch Award in chemistry.** **Page 7**

■ **Agracetus is field-testing genetically engineered, disease-resistant tobacco but testing of bacteria preventing frost damage postponed again.** **Page 8**

■ **William R. Graham has been appointed Presidential science adviser.** **Page 8**

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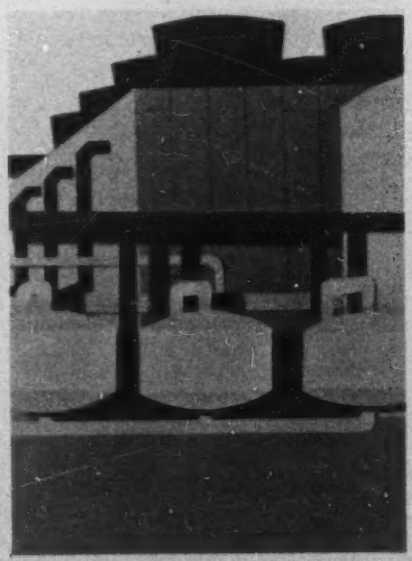
ACS News

Allocations to local sections and to C&EN will increase with the rise in membership dues for 1987. **Page 98**

Cover: Paper sculpture by Sharon Wolfgang



Facts & Figures

The U.S. chemical industry showed moderate growth in 1985, but much restructuring and other efficiency moves affected profits. C&EN's yearly survey of the industry here and abroad identifies the major trends. **Page 32**

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Petrochemical Selling Prices and Margins Shrink as Volume Increases

Profits in ethylene, propylene, butadiene, benzene, and *p*-xylene are unlikely to improve this year for major producers

Bruce F. Greek, C&EN Houston

Despite increased output of many petrochemicals, producers are seeing their margins shrink. Profits grew early in 1986 as prices of crude oil, its products, and other feedstocks for making petrochemicals declined much faster than did selling prices of petrochemicals. But now, selling prices for many olefins are weakening, and feedstock prices have begun to rise rapidly. When earnings figures for 1986 are complete, petrochemical profits will be better than in several years, yet not so good as would be expected, considering the decline in feedstock and other costs.

The volatility in feedstock prices and, to a lesser degree, in petrochemical selling prices almost ended meaningful planning this spring. Even now, forecasts for costs, volumes, and prices of petrochemicals must be changed often as feedstock prices change. This "shoot-from-the-hip" situation probably won't end until sometime next year when oil prices stabilize.

In the past, feedstock and selling prices have been volatile, but never so volatile as they were this year.

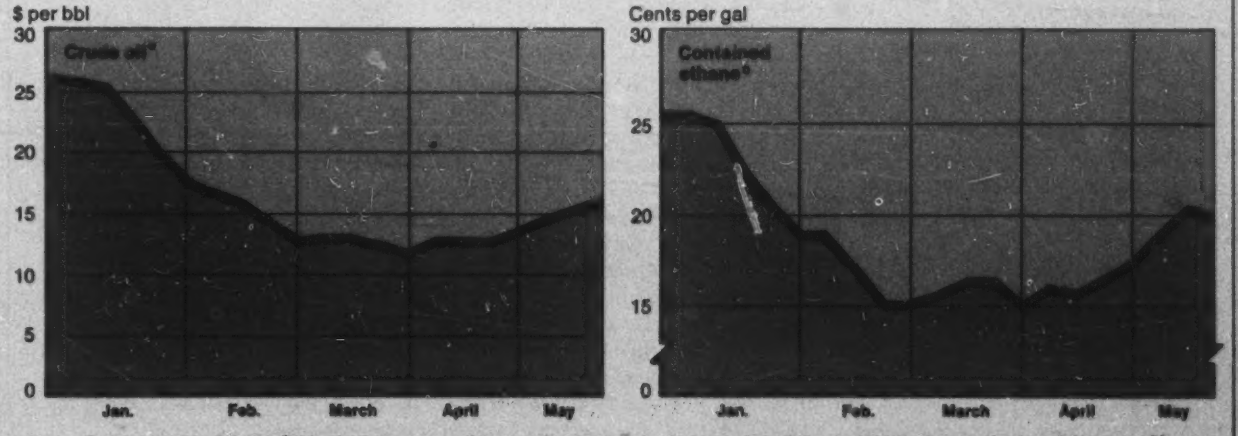
Key Chemicals

That volatility has led to a new kind of pricing situation. For major-volume olefins, such as ethylene, selling prices frequently are settled after the month ends. By determining prices after a month's sales are completed, the variations in feedstock costs during the month can be assessed more fairly for both buyers and sellers, or so goes the thinking. That contrasts sharply with former selling situations in which contracts often covered a year and contained seldom-used price reopening clauses allowing price adjustments to be made quarterly.

Some observers continue to forecast stability for feedstock prices later this year and on into 1987, but that stability remains elusive. A recent sign that steam crackers might shift back toward heavier feedstocks (and possibly higher costs) comes from announcements of plans by large natural gas producers to shut down a major part of their production. These moves are likely to reduce recovery of natural gas liquids, causing prices of those feedstocks to rise. The impact of such changes will not be felt until later in 1986, but olefin prices could rise even more than prices of aromatics had increased by late May. Eventually overall profit margins could shrink even more than they have already.

For some details of the near-term outlook for five of the largest basic petrochemicals, please see the following pages.

Prices for feedstocks to make basic petrochemicals begin to rise from recent lows

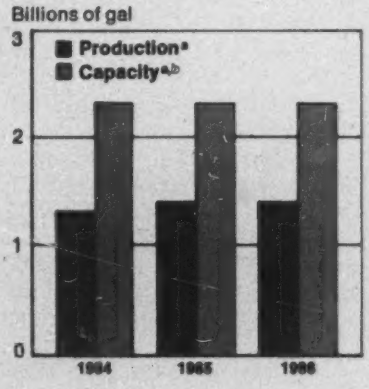


a Western Texas Intermediate. b At Mont Belvieu, in ethane-propane mixtures used as steam-cracker feedstocks. Note: Dollars per bbl (42 gal) averaged and rounded to nearest 25 cents; cents per gal averaged and rounded to nearest 0.5 cent. Source: C&EN estimates

Benzene

- **Production flat**
- **Capacity holding**
- **Prices down**

PRODUCTION/CAPACITY



a All grades. b First quarter.

MAJOR PRODUCERS

Amoco Oil, Chevron, Coastal Corp., Exxon Chemical, Shell Oil

HOW MADE

Catalytic reforming and thermal (steam) cracking of petroleum hydrocarbons and coking of coal with subsequent separation; dealkylation of toluene

MAJOR DERIVATIVES

Ethylbenzene 50%, cumene 20%, cyclohexane 15%, aniline 5%

MAJOR END USES

Fabricated plastics and rubber 55%, phenolic resins 20%, nylons 15%

FOREIGN TRADE

Exports—small and declining to about 10 million gal; imports—large, but may fall below 150 million gal

PRICE

80 to 90 cents per gal, Gulf Coast

Following a modest gain during 1985, benzene production will remain in the doldrums this year. Overall demand for benzene in its major chemical uses—styrene, cumene, cyclohexane, and aniline—will change little. U.S. consumption of those benzene derivatives and their derivatives will increase, but export demands will decline. For benzene itself, the net of imports over exports will decline slightly, but will remain nearly 10% of production.

From slightly less than 1.4 billion gal in 1985, benzene output from all sources in 1986 is estimated to grow about 50 million gal to nearly 1.45 billion gal. The major sources of benzene—catalytic reforming and pyrolysis gasoline (a significant coproduct of steam cracking hydrocarbons heavier than butane to make ethylene)—will change little during 1986. Output of pyrolysis gasoline has begun to decline a bit, following a rise during the first quarter of 1986. The reversal comes from a shift to a slightly lighter mix of feedstocks for steam crackers. Benzene produced by hydrodealkylation and disproportionation of toluene also will slip slightly. The minor quantities of benzene recovered from coking of coal, possibly 30 to 35 million gal, will decline again as coking declines because of low demand.

Capacity to produce benzene from all of its sources totals about 2.3 billion gal, a flexible figure, depending on processing conditions, feedstock choices, and kinds of catalysts employed. It could range as much as 200 million gal above or below that total. No significant changes in nameplate capacity are expected this year, because additional ethylene capacity recently put on stream has been designed to run on light hydrocarbons.

With benzene production at 1.4 billion gal and capacity at about 2.3 billion gal, the U.S. average operating rate for all benzene production sources will be 60%, roughly the level of the past two years. For economic reasons, coal tar and hydrodealkylation units will be run at lower levels of capacity.

Thus far in 1986, prices of benzene and other aromatics have declined drastically as a result of the fall in crude oil prices. Because petroleum reformate accounts for about 45% of benzene production, benzene prices correlate closely with gasoline prices. Gasoline prices currently are a bit unstable owing to a number of factors. They include increasing demand for gasoline as the summer driving season begins, fluctuating crude oil prices, and changing travel plans as vacationers seek to avoid foreign travel. Benzene prices, which dropped below 75 cents a gal on a spot basis on the Gulf Coast, are moving toward 90 cents this month. Prices could be higher by July 1 depending on need for reformate and the octane value of the reformate, which would result from catalyst and processing changes. However, imports of benzene will dampen efforts to raise prices.

Prices of benzene have relatively little effect on chemical use, because no substitute exists for benzene in such uses. More than half of chemically used benzene goes to make ethylbenzene for styrene. Although U.S. consumption of styrene is increasing because of growing demand for nondurables or disposables, exports are declining as other sources replace U.S.-produced styrene. Consumption of benzene in styrene, therefore, will be down marginally during 1986.

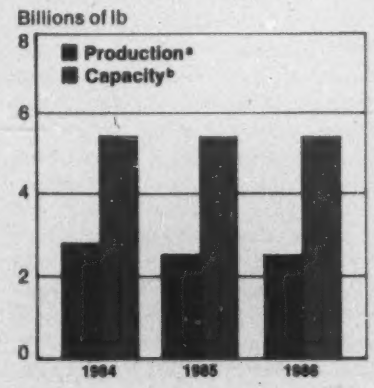
Among other uses of benzene, cumene production will increase a little. Demand for phenol that goes to various resins and plastics has improved, but an inventory of finished plywood dampens the market. Output of cyclohexane, used mainly for making nylon fibers, will be increasing as a result of lower imports from Canada. However, the increase in cyclohexane production, at less than 15% of benzene demand, will not completely offset the decline in demand for making styrene.

$CH_2=CH-CH=CH_2$

Butadiene

- ***Production holding***
- ***Much capacity down***
- ***Prices weakening***

PRODUCTION/CAPACITY



a All grades. b First quarter; extraction capacity; includes shut-down capacity not expected to restart.

MAJOR PRODUCERS

Amoco Chemicals, El Paso Products, Exxon Chemical, Shell Chemical, Texas Petrochemicals

HOW MADE

Thermal (steam) cracking of hydrocarbons ranging from ethane to heavy gas oil; dehydrogenation of butylenes

MAJOR DERIVATIVES

Styrene-butadiene rubber and latex 45%, polybutadiene rubber 20%

MAJOR END USES

Fabricated rubber products 75%, fabricated plastics 10%, fibers 10%

FOREIGN TRADE

Exports—small, declining to 125 million lb; imports—large, but falling to 500 million lb

PRICE

About 15 cents per lb

Butadiene consumption is expected to decline in 1986. Production, however, will hold close to last year's level, because most butadiene is made as a coproduct of ethylene in steam crackers. Despite use of lighter hydrocarbon feedstocks, increased ethylene production will keep butadiene production high. Imports of butadiene are forecast to decline steeply as consumers require less and inventories are drawn down. Prices will continue to be under pressure from imported material and from consumer expectations that lower production costs (resulting from lower crude oil prices) will be passed on to them.

More than 75% of butadiene consumption goes into synthetic rubber. This year, U.S. synthetic rubber production likely will be lower than in 1985. That slump will stem mainly from increased imports of finished rubber products, especially tires on imported cars and replacement market tires.

Earlier this year, butadiene production increased, resulting from a shift to slightly heavier feedstocks for steam crackers whose primary product is ethylene. An annualized production rate based on the first quarter exceeds 2.5 billion lb per year. But, because demand to make the several kinds of synthetic rubber (of which butadiene is an important comonomer) is stable to slightly down, inventories of butadiene increased in the first quarter.

During the current quarter, butadiene production apparently slowed, even with startup of the two additional steam crackers. Those crackers are expected to be fed mostly ethane and propane, which will minimize butadiene output. The production slowdown results from a review by steam cracker operators of the total economics of their plants. Their analysis shows that using heavier feedstocks is now less profitable because selling prices for the coproducts, which include butadiene, have declined. The shift to lighter hydrocarbon feedstocks that began in April has held through May. The economics of producing gasoline for the approaching summer driving season will cause light hydrocarbons to be preferable feedstocks for steam crackers for about two months.

Butadiene inventories dropped during April probably because of the reduced output from steam crackers. Inventories are expected to decline further during this quarter unless unusually large imports of butadiene arrive and are not bought at low spot prices.

As with other basic petrochemicals, prices for butadiene have fallen drastically this year. As 1986 began, list prices were nearly 30 cents per lb. By early May, butadiene prices, which also are similar to those of most other basic petrochemicals, were quite volatile at about 15 cents per lb, with rumors of spot prices for imported butadiene on ships nearing the coast, running 10 to 20% lower.

The low spot prices for butadiene indicate changes that could be coming in imports, which have accounted for more than a quarter of demand at times. The net-back profit received by European sources after deducting production and shipping costs has disappeared. Another cause for declines in imports stems from the shift in feedstock composition for steam crackers in Europe, reducing butadiene production. That results from increased quantities of light hydrocarbons being produced from the North Sea and imported from northern Africa and the Middle East.

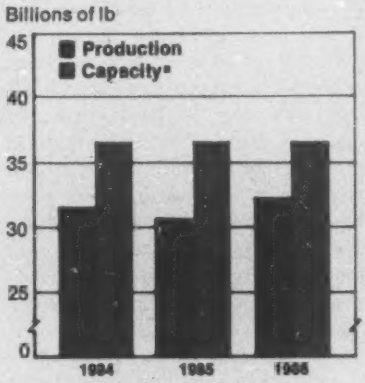
Because of diminished profits and production in Europe, imports of butadiene will be reduced as much as a third in 1986. Butadiene imports in 1985 have been estimated to total 830 million lb. In the first quarter of 1986, imports were 114 million lb, down nearly two thirds from the 322 million lb imported in first-quarter 1985. Annualizing the first-quarter 1986 imports gives a yearly total of only 456 million lb, less than most early forecasts of about 500 million lb. The reduced imports, therefore, will account for practically all of the decline in U.S. butadiene consumption.

$CH_2=CH_2$

Ethylene

- *Production improving*
- *Capacity unchanged*
- *Prices down*

PRODUCTION/CAPACITY



a First quarter; includes 2 billion lb of shut-down capacity not expected to restart.

MAJOR PRODUCERS

Amoco Chemicals, Exxon Chemical, Lyondell Petrochemical (Arco), Phillips, Shell Chemical

HOW MADE

Thermal (steam) and catalytic cracking of hydrocarbons ranging from ethane to heavy gas oil

MAJOR DERIVATIVES

Polymers 50%, ethylene oxide 20%, vinyl chloride 15%, styrene 10%

MAJOR END USES

Fabricated plastics 70%, antifreeze 10%, fibers 5%, solvents 5%

FOREIGN TRADE

Exports and imports negligible

PRICE

Volatile, ranging from 14.5 to 15.5 cents per lb

Ethylene production this quarter is expected to exceed the 8.07 billion lb output for the first quarter of 1986. Thus, producers will have their best quarter of the past three years. With output of all major derivatives at near record levels, demand for ethylene remains strong. As crude oil prices move up from recent historical lows, feedstock prices are firming, but ethylene prices have yet to reflect higher production costs.

Later this year, because of inventory building and seasonal declines in consumption, ethylene production could slow slightly from the current pace. Some maintenance shutdowns are anticipated for the second half of 1986, which (along with the usual brief interruptions due to power outages and equipment malfunctions) will push output down some.

Production of ethylene in 1986 will total 32 billion lb, up 5% from a preliminary estimate of 30.5 billion lb last year. The 1986 estimate includes some output from at least two startups of units that either had been shut down for a long period of time or were an addition to existing capacity. This quarter, about 1 billion lb per year of additional ethylene capacity came on stream at plants owned by Occidental Chemical and Phillips. Those units could contribute 500 million lb of production this year. Because of the current high rate of plant operation, an additional 300 million to 500 million lb of capacity may be added during the year through debottlenecking efforts at companies that operate steam crackers.

As 1986 began, operable ethylene nameplate capacity totaled about 34.5 billion lb. Another 2 billion lb of capacity remained on stand-by. If the capacity recently started up contributes 500 million lb of operable capacity during 1986, the operating rate for in-place capacity will be 86.5% of nameplate, one of the highest rates in recent years. The operating rate of actual operable units, however, will be even higher—more than 91%, which is the full rate for effective capacity.

That operating level for steam crackers making ethylene indicates optimum efficiency. Pricing, however, doesn't reflect the full capacity operations. Selling prices for ethylene moved up strongly at the end of last year, but since then they have declined precipitously. At the end of May, most ethylene was selling for about 15 cents per lb, down 4 to 5 cents since January. Buyers who continue to cite declining prices of crude oil and of gas and gas liquids this year are keeping strong pressure on ethylene pricing. Recent increases in crude oil demand and expected increases in gasoline and jet fuel demand this summer likely will offset pressure for lower ethylene prices. Those demand increases could cause ethylene feedstock prices to firm. Whether producers will resist demands to lower prices and try to implement increases beginning July 1 is being debated on the Gulf Coast.

The strong demand for ethylene and ethylene derivatives plus a large drawdown of inventory during the fourth quarter of 1985 could put the industry in a precarious position should an accident occur such as happened at the major storage area at Mont Belvieu, Tex., late last year. During the first quarter of 1986, inventories of ethylene were built from about 900 million lb to nearly 1.2 billion lb. Some inventory drawdown occurred during April and early May as demand for derivatives pressured producers. That pressure now has eased and inventories could be back to about 1.2 billion lb. The higher inventory, however, amounts to only about a two-week supply if annual production totals 32 billion lb.

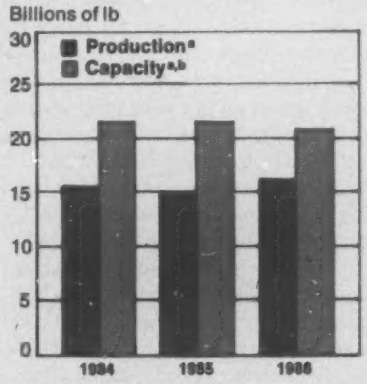
The 1986 surge in ethylene production, in capacity utilization, and in profitability could spur some producers to consider increasing longer-term supply. However, those factors are not sufficient to prompt a company's board of directors to vote capital for a new steam cracker in the U.S.

$CH_2=CH-CH_3$

Propylene

- *Production rising*
- *Capacity steady*
- *Prices under pressure*

PRODUCTION/CAPACITY



a All grades. b First quarter; some shut-down capacity not expected to restart.

MAJOR PRODUCERS

Amoco Chemicals, Exxon Chemical, Lyondell Petrochemical (Arco), Phillips, Shell Chemical

HOW MADE

Thermal (steam) and catalytic cracking of hydrocarbons ranging from ethane to heavy gas oil

MAJOR DERIVATIVES

Polymers 35%, acrylonitrile 15%, propylene oxide 10%, cumene 10%,

MAJOR END USES

Fabricated plastics 60%, fibers 15%, solvents 10%

FOREIGN TRADE

Exports—negligible; imports—tiny, about 500 million lb

PRICE

Chemical grade 11 cents per lb, polymer grade 12 cents per lb

Propylene production this year will have the best growth of any of the major-volume basic petrochemicals, with demand spurred mainly by growth in polypropylene. The capacity to make or recover propylene will decline slightly because of shutdowns, but it is sufficient to meet demand.

Propylene produced to make various chemicals and polymers in 1986 could total 16 billion lb, up more than 7% from about 14.9 billion lb in 1985. That estimate is based on the likelihood that the high growth in consumption during the first quarter will be repeated and that the general economy will grow modestly because of lower crude oil prices. Despite a large excess capacity to make propylene, such a level of growth, however, will decline late in 1986 and on into 1987.

Propylene capacity depends on petroleum refining and ethylene manufacture. Potential refinery sources of propylene exceed ethylene manufacture two to one. However, economics radically reduce the amount of refinery-produced propylene that can be recovered. For example, significant quantities of propylene in off-gas streams at refineries are burned because of the high cost of recovering propylene from the low concentrations in the streams. In contrast to refinery propylene, practically all propylene produced as a coproduct of ethylene in steam crackers is recovered and purified. Such coproduction accounts for most of the polymer-grade propylene (99.5%) consumed. Estimates of capacity for propylene are based on the composition of feedstocks to steam crackers and to refinery catalytic crackers, on severity of operation, and on purification capacity for refinery cracking units. At the beginning of 1986, those sources had a practical total of 21 billion lb a year, with a possible variation of ±5%.

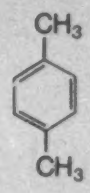
Use of capacity varies widely. During the early part of this year, propylene output from steam crackers rose as feedstock was shifted to heavie hydrocarbons. At the same time, gasoline production was held down, reducing refinery cracking operations. The feedstocks to steam crackers now have been lightened, and refiners are pushing gasoline output higher. Refinery propylene production and consumption as an alkylation material have risen. The value of propylene contained in cracked gases streams has risen, but may have topped out temporarily as supplies of other suitable alkylate materials, such as butylenes, have become limited.

The shifts in production, particularly at refineries, have made propylene pricing volatile. Recent prices are 11 cents per lb for chemical grade (90 to 95%) and 12 cents per lb for polymer grade. Because such a large share of propylene is produced from hydrocarbons heavier than propane, price increases are expected as crude oil prices rise. Ethane and propane prices generally will follow along.

Prices for most propylene derivatives haven't fallen so much, partly because of the high level of operation of polypropylene plants. In 1986, the average operating rate will be above 90%. Polypropylene requires about 35% of the propylene consumed in the U.S. Growth in polypropylene demand is expected to hold at about 5% annually. Capacity could become limited, but not until 1987 or later, depending on debottlenecking and processing improvements.

Acrylonitrile falls a distant second as a chemical consumer of propylene. The major domestic use of acrylonitrile is in fibers, and that use is suffering along with all segments of the textile industry.

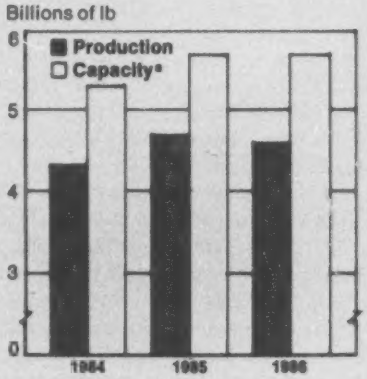
Most of the other chemical uses of propylene—cumene, propylene oxide, isopropyl alcohol, oxo alcohols, and other smaller uses—are growing slowly. Although those account for half of chemical- and polymer-grade propylene consumption, they are not expected to have so much effect on demand for propylene as will polypropylene.



p-Xylene

- **Production may fall**
- **Capacity flat**
- **Prices down**

PRODUCTION/CAPACITY



a First quarter.

MAJOR PRODUCERS

Amoco Chemicals, Arco Chemical, Chevron Chemical, Exxon Chemical, Phillips

HOW MADE

Reforming and thermal (steam) cracking of petroleum hydrocarbons and subsequent separation

MAJOR DERIVATIVES

Dimethyl terephthalate 55%, terephthalic acid 45%

MAJOR END USES

Polyester fibers 75%, molded items (mostly bottles) 15%, films 10%

FOREIGN TRADE

Exports—declining to about 1.1 billion lb; imports—holding at about 100 million lb

PRICE

About 19.5 cents per lb, Gulf Coast

Prospects for U.S. production of *p*-xylene in 1986 are good but less favorable than in 1985. Possible shifts in export demand late this year, plus uncertainty in demand for polyester fibers and bottle resins, make it difficult to pin down an estimate for 1986 production. Consumers of *p*-xylene have been asking for and now are getting, or soon will be, higher-purity material, possibly reducing plant capacity.

Because of changes in the various factors that affect *p*-xylene demand, production forecasts now cluster around 4.6 billion lb for 1986, down about 2% from 1985. Increased consumption of polyester bottle resins is certain to push up demand for *p*-xylene. Exports are expected to decline late this year, as new capacity comes on stream in the Far East. In the second half of 1986, pressure from cotton prices and imported garments will work against consumption of polyester fibers.

If production in 1986 totals 4.6 billion lb and capacity remains at 5.7 billion lb, the average plant operating rate will be just under 80%. That obviously low rate doesn't take into account the efforts that producers are making to increase product *p*-xylene purity to 99.5%. Some plants have been shut down for a month at a time so that equipment can be installed and process changes can be made to obtain such purity. Even after changes in a plant have been made, production likely will move up slowly until operating experience develops. As a result, the actual operable capacity to make *p*-xylene may decline 10% during 1986. If that reduction occurs, the operating rate for this year will move to about 90%.

Uncertainties of demand and the move toward higher purity have kept *p*-xylene prices relatively higher than prices of other aromatics during the crude oil price declines. With current demand for gasoline increasing, mixed xylenes, important sources for octane values, could rise in price. Supplies of mixed xylenes, source of *p*-xylene, are tightening as well. Producers of *p*-xylene are expected to pass on these increased costs of raw materials and of processing for higher purity.

The biggest unknown in *p*-xylene output for 1986 lies in export demand. Rumors abound that U.S. exports will be reduced soon by new capacity being built in Japan and in other Far Eastern countries. Any possible reductions in exports to Japan could be offset by increases in exports to Mexico, where operating problems with its *p*-xylene plant are limiting production, and by exports to Indonesia where startup of a terephthalic acid plant is beginning. The net of exports over imports in 1986 could balance out at about 1.1 billion lb, down modestly from the 1985 net.

Except for small quantities consumed in a few tiny uses, all *p*-xylene consumed in the U.S. goes to make dimethyl terephthalate and terephthalic acid in a ratio of roughly 55:45. Those materials, in turn, go to make polyesters—almost entirely ethylene and butylene derivatives. Some of the polyester is exported, but most is fabricated into fibers, films, and molded items, mostly bottles.

In the U.S., the polyester fiber demand for *p*-xylene likely will fall again, because apparel imports and cotton consumption are expected to rise. Cotton consumption will increase as prices decrease this summer and as fashion moves more toward all-cotton fabrics. Such changes could be over by the end of the year, but they will affect *p*-xylene demand throughout 1986.

Polyester bottle resins continue to be the bright spot in *p*-xylene demand. The resins could require 350 million lb of *p*-xylene this year, up at least 10% from consumption in 1985. The growth in the market for bottle resins will continue erratically as technical developments make it possible to use these resins for smaller-sized bottles and hot-fill applications. The market for films, which require relatively small quantities of polyester, is not growing very fast.

Facts & Figures

for the chemical industry

Reflecting the sluggish performance of the overall economy, the U.S. chemical industry in 1985 experienced a year of moderate growth but mixed financial results.

For the industry as a whole, production increased, with plastics and a handful of specialty products setting the pace. On the other hand, in such major areas as inorganic chemicals, man-made fibers, and especially agricultural chemicals, 1985 was a dull if not downright depressed year.

Financially, the record was even more confused. In a widespread effort to revamp the industry's structure and enhance operating efficiency, many companies, both large and small, undertook a dizzying assortment of asset write-downs and spinoffs, staff reduction programs, and various accounting changes. The resulting special charges and credits drastically affected 1985 income statements for the industry as a whole.

Those moves, however, probably will set the stage for a better record in 1986. Output is likely to edge higher again, albeit rather shakily. Profits already are looking stronger. And the weaker U.S. dollar promises relief from one long-standing problem by improving the competitive position of U.S. chemical producers against their counterparts overseas.

The data presented on the following pages of C&EN's annual Facts & Figures issue illustrate these trends statistically, providing a measure of the chemical industry's recent performance in the U.S. and, to a lesser extent, in several other important chemical-producing nations. The data pulled together here come from a diverse variety of sources, such as government agencies, trade associations, and international organizations, as well as the individual companies that comprise the complex industry. The data, in many cases, have been used by C&EN's staff to develop analytical measures and comparisons that help put the industry's recent results into better perspective.

at a glance

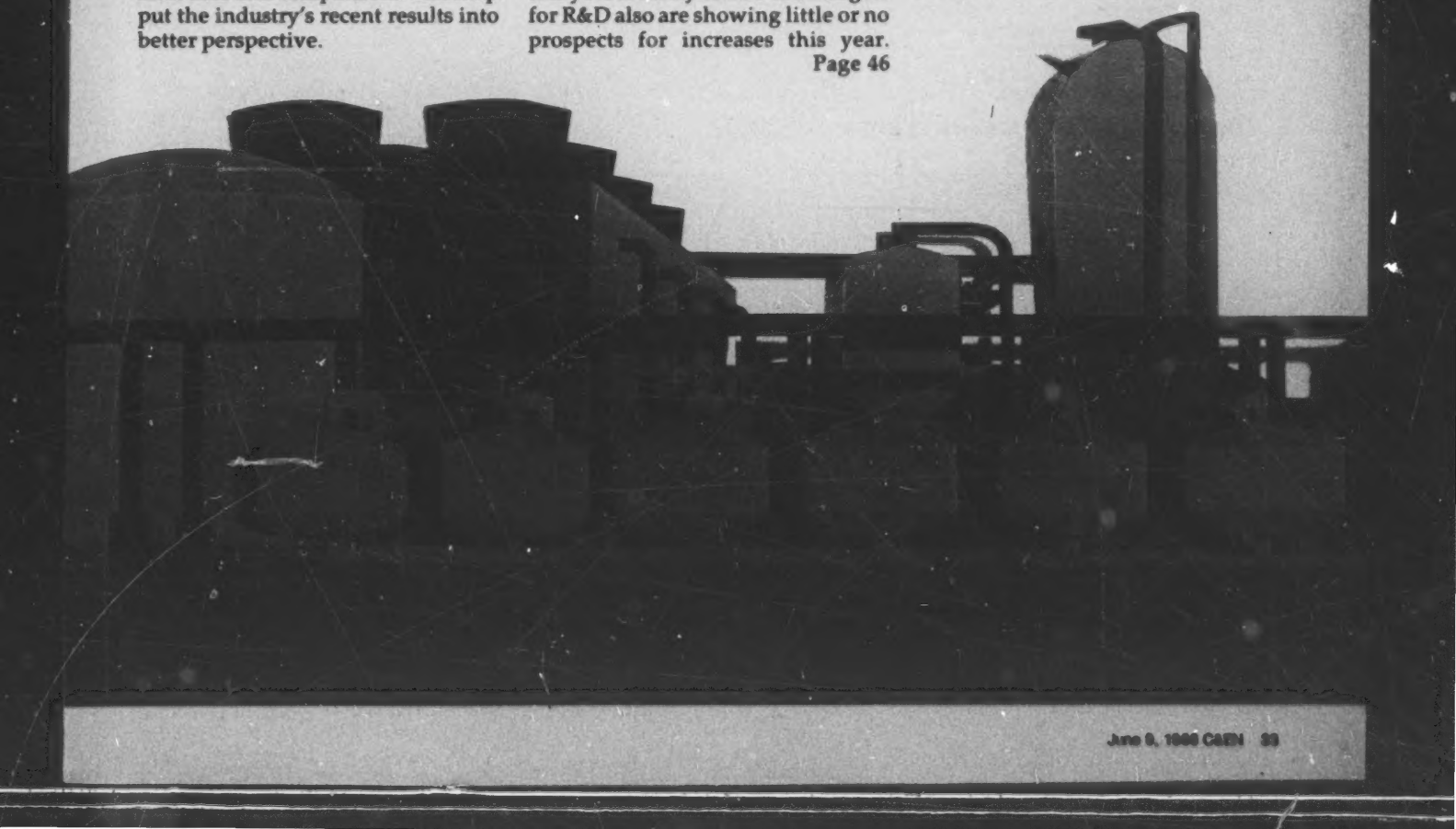
Section One: Production
In the U.S. chemical industry, output continued to expand in 1985. But the pace slowed markedly from the year before. And for many sectors of the industry, production actually fell a bit from the 1984 level. Plastics was a strong area. On the other hand, man-made fibers had a mediocre year, as imports cut into U.S. demand. A poor year for U.S. farmers, meanwhile, resulted in a decline in production of agricultural chemicals. Page 34

Section Two: Finance
Earnings declined for U.S. chemical companies in 1985, after three years of growth, as sales stagnated, prices came under pressure, and chemicals produced abroad cut into markets for made-in-America products. Capital spending, meanwhile, continues to expand, although the increase this year is likely to be slim. Budgets for R&D also are showing little or no prospects for increases this year. Page 46

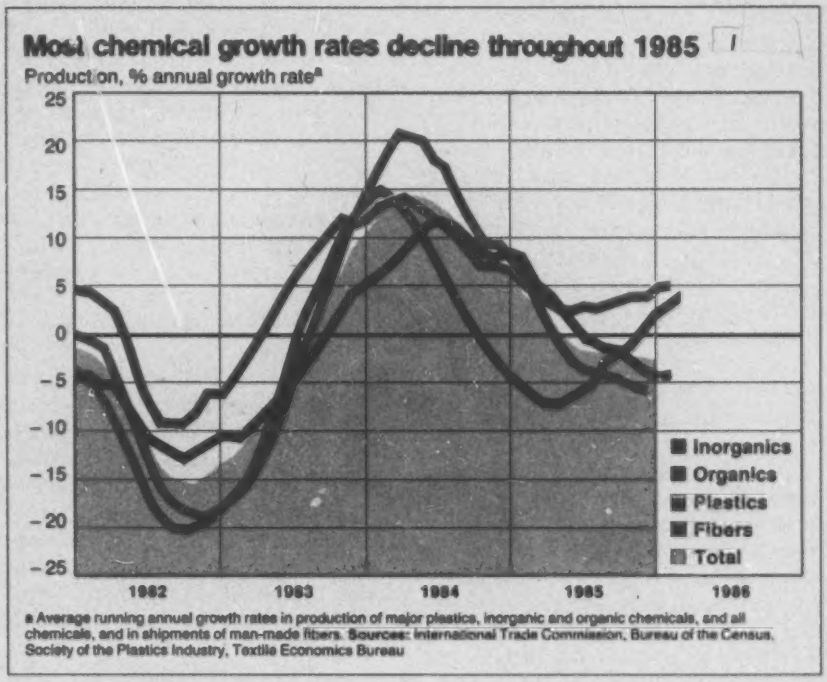
Section Three: Employment
The number of workers employed in the chemical industry declined last year, after rising in 1984, to the lowest level in the past decade. But with output up slightly, the productivity of the industry's work force improved from the year before and unit labor costs were down. Page 61

Section Four: Foreign Trade
World trade in chemicals has slipped from its peak level of 1984, largely because of lower imports on the part of underdeveloped nations. And the long-standing U.S. trade surplus in chemicals continued to shrink, as imports rose but exports, hurt by a strong U.S. dollar, dwindled. Page 66

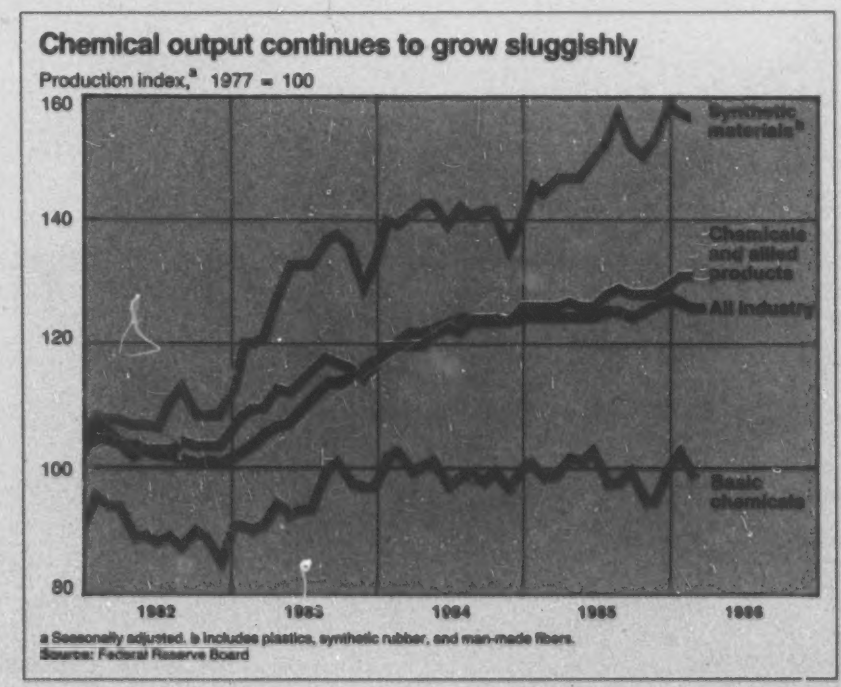
Section Five: Foreign Chemical Industries
Outside the U.S., 1985 was a mixture of good and bad for chemical producers. Profitability generally was up for chemical companies in West Europe. However, earnings deteriorated in Japan's petrochemical industry, and the outlook remains poor there. Unsatisfactory prices eroded the profits of chemical companies in Canada. Page 70



Production up modestly in 1985



a Average running annual growth rates in production of major plastics, inorganic and organic chemicals, and all chemicals, and in shipments of man-made fibers. Sources: International Trade Commission, Bureau of the Census, Society of the Plastics Industry, Textile Economics Bureau



a Seasonally adjusted. b Includes plastics, synthetic rubber, and man-made fibers.
Source: Federal Reserve Board

Production by the U.S. chemical industry continued to grow sluggishly throughout 1985, increasing only about 4% over 1984. Yet chemical firms outperformed U.S. manufacturers as a whole, whose output grew only 3% from the year before. However, production of chemical plants in the early months of 1986 leveled off and even dropped in some sectors.

The largest gains in chemical output for 1985 were for plastics and for soap and toiletries. Demand for new housing and autos, spurred by lower interest rates, helped keep demand for plastics growing healthily.

Plastics materials' output was up 10% in 1985—the third new high in as many years. Strong gains were made by major thermoplastics, most notably high-density polyethylene. Thermosetting resins did not perform so well, on the other hand, with output increasing an average of only 1%. After two strong years, synthetic rubber production dropped 11%. Man-made fibers endured another mediocre year, as imported textile products undercut domestic demand, with only production of olefins registering an increase.

Among chemical products, output of soap and toiletries was up 12%. Production of drugs and medicines grew 2% in 1985, however, and production of paints dropped 1%.

Output of basic organic chemicals increased 3% in 1985, but basic inorganic chemicals fared less well. Only production of industrial gases grew in 1985 compared with 1984. Output of alkalies and chlorine, inorganic pigments, and other inorganic chemicals, including acids and fertilizer materials, all dropped off slightly last year. In addition, farmers' financial problems resulted in agricultural chemicals production decreasing 3%.

TOP 50 CHEMICALS: Output steady for organic chemicals but down for inorganics

Rank 1995	Rank 1994[a]		Billions of lb 1995	Billions of lb 1994	Common units[b] 1995	Common units[b] 1994	Average annual growth 1994–95	1993–94	1990–95	1975–95
1	1	Sulfuric acid	79.23	83.60	39,615 tt	41,802 tt	−5.2%	11.6%	−2.1%	2.0%
2	2	Nitrogen	46.88	47.90	647 bcf	661 bcf	−2.1	18.0	6.2	9.8
3	3	Ammonia	32.40	33.38	16,201 tt	16,692 tt	−2.9	19.6	−3.8	−0.1
4	4	Lime[c]	31.60	31.98	15,800 tt	15,992 tt	−1.2	7.8	−3.6	−1.4
5	5	Oxygen	31.37	31.87	379 bcf	385 bcf	−1.6	11.3	−2.5	0.7
6	6	Ethylene	30.55	31.38	30,550 mp	31,383 mp	−2.7	9.4	1.3	4.1
7	8	Sodium hydroxide	21.92	21.83	10,959 tt	10,914 tt	0.4	6.7	−1.2	1.3
8	7	Phosphoric acid	20.98	22.74	10,492 tt	11,370 tt	−7.7	16.4	−0.7	3.2
9	9	Chlorine	20.93	21.40	10,465 tt	10,699 tt	−2.2	7.4	−1.7	1.3
10	10	Sodium carbonate[d]	17.19	17.02	8,597 tt	8,511 tt	1.0	0.5	0.8	7.0
11	12	Nitric acid	15.56	15.45	7,778 tt	7,726 tt	0.7	10.9	−3.4	0.3
12	11	Propylene	14.93	15.56	14,930 mp	15,559 mp	−4.0	11.5	1.8	5.5
13	14	Ammonium nitrate[e]	13.81	14.29	6,906 tt	7,146 tt	−3.4	14.5	−5.4	−0.3
14	15	Ethylene dichloride	13.63	10.71	13,632 mp	10,710 mp	27.3	−6.9	4.2	5.5
15	13	Urea[f]	13.11	14.87	6,556 tt	7,433 tt	−11.8	23.6	−3.5	6.3
16	16	Benzene	9.73	9.71	1,321 mg	1,318 mg	0.2	6.9	−8.0	2.6
17	17	Carbon dioxide[g]	8.63	9.13	4,315 tt	4,565 tt	−5.5	16.5	7.5	8.8
18	20	Ethylbenzene	8.55	7.56	8,547 mp	7,562 mp	13.0	−4.0	2.3	5.9
19	22	Vinyl chloride	7.78	6.09	7,775 mp	6,085 mp	27.8	−11.5	3.8	6.4
20	19	Styrene	7.45	7.71	7,454 mp	7,709 mp	−3.3	13.3	1.7	4.8
21	23	Terephthalic acid[h]	7.17	5.91	7,165 mp	5,912 mp	21.2	5.1	3.4	4.5
22	18	Methanol	5.98	8.19	5,979 mp	8,186 mp	−27.0	2.6	−3.5	1.5
23	25	Ethylene oxide	5.83	5.70	5,833 mp	5,699 mp	2.4	3.0	2.2	2.7
24	24	Formaldehyde[i]	5.70	5.82	5,699 mp	5,815 mp	−2.0	6.4	0.5	2.3
25	26	Hydrochloric acid	5.56	5.46	2,780 tt	2,732 tt	1.8	12.9	−0.8	3.3
26	21	Xylene	5.25	6.15	729 mg	854 mg	−14.6	17.6	−4.3	1.3
27	27	Toluene[j]	4.99	5.28	688 mg	728 mg	−5.5	−6.7	−7.5	−0.2
28	29	*p*-Xylene	4.72	4.26	4,724 mp	4,264 mp	10.8	3.6	2.2	6.6
29	28	Ethylene glycol	4.68	4.82	4,679 mp	4,823 mp	−3.0	9.0	1.3	2.1
30	30	Ammonium sulfate	4.10	4.13	2,049 tt	2,067 tt	−0.9	5.7	−0.8	−0.3
31	31	Cumene	3.33	3.75	3,328 mp	3,754 mp	−11.3	12.2	−0.8	5.2
32	35	Acetic acid	2.88	2.62	2,875 mp	2,619 mp	9.8	−6.7	−0.7	2.7
33	32	Potash[k]	2.86	3.45	1,296 tmt	1,564 tmt	−1.71	9.4	−10.4	−5.4
34	34	Phenol[l]	2.78	2.89	2,777 mp	2,889 mp	−3.9	9.6	1.6	4.7
35	33	Carbon black	2.57	2.89	2,571 mp	2,893 mp	−11.1	15.9	0.2	−0.7
36	36	Butadiene[m]	2.53	2.45	2,525 mp	2,452 mp	3.0	4.2	−2.0	−0.3
37	44	Sodium sulfate[n]	2.40	1.74	1,199 tt	872 tt	37.5	2.1	1.0	−0.2
38	38	Acrylonitrile	2.35	2.22	2,346 mp	2,219 mp	5.7	3.4	5.1	6.8
39	40	Vinyl acetate	2.11	2.02	2,112 mp	2,024 mp	4.3	3.1	1.9	5.1
40	37	Aluminum sulfate	2.01	2.26	1,003 tt	1,129 tt	−11.2	2.4	−4.8	−1.3
41	43	Propylene oxide	1.88	1.78	1,882 mp	1,779 mp	5.8	−4.5	1.3	2.1
42	42	Acetone	1.80	1.86	1,801 mp	1,862 mp	−3.3	0.2	−2.8	0.9
43	41	Cyclohexane	1.74	1.99	1,743 mp	1,994 mp	−12.6	20.4	−2.4	0.1
44	49	Methyl *tert*-butyl ether[o]	1.69	1.38	1,693 mp	1,376 mp	23.0	64.0	nm	nm
45	45	Titanium dioxide	1.63	1.67	814 tt	835 tt	−2.5	10.3	2.6	3.0
46	39	Calcium chloride[p]	1.60	2.10	800 tt	1,049 tt	−23.7	22.4	−4.0	−3.7
47	46	Sodium silicate	1.47	1.50	736 tt	750 tt	−1.9	3.0	−1.8	0.2
48	48	Adipic acid	1.30	1.39	1,298 mp	1,390 mp	−6.6	8.6	−2.6	−0.3
49	50	Sodium tripolyphosphate	1.21	1.35	607 tt	675 tt	−10.1	0.9	−3.5	−2.4
50	47	Isopropyl alcohol	1.12	1.39	1,118 mp	1,394 mp	−19.8	15.3	−9.4	−3.0
		TOTAL ORGANICS	175.55	175.46			0.1%	8.5%	−0.1%	4.0%
		TOTAL INORGANICS	365.92	377.16			−3.0%	11.8%	−1.4%	1.9%
		GRAND TOTAL	541.48	552.62			−2.0%	10.1%	−0.9%	2.5%

a Revised. b tt = thousands of tons, bcf = billions of cubic feet, mp = millions of pounds, mg = millions of gallons, tmt = thousands of metric tons. c Except refractory dolomite. d Natural and synthetic; synthetic production ended February 1995. e Original solution. f 100% basis. g Liquid and solid only. h Includes both acid and ester without double counting. i 37% by weight. j All grades. k K_2O basis. l Synthetic only. m Rubber grade. n High and low purity. o Production data for earlier years unavailable. p Solid and liquid. nm = not meaningful.

PRODUCTION: For the chemical industry, plastics are strong in 1985 but inorganics weak

Industrial production indexes, 1977 = 100	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	Annual change 1984–85	Annual change 1975–85
Total index	124.5	121.8	109.2	103.1	111.0	108.6	110.7	106.5	100.0	92.6	84.8	2%	4%
Manufacturing, total	127.1	123.9	110.2	102.2	110.5	108.2	111.5	107.1	100.0	91.9	83.4	3	4
Nondurable manufacturing	125.6	122.5	113.7	105.5	109.7	107.0	108.2	105.5	100.0	93.1	84.5	3	4
Chemicals and products	127.1	121.7	114.0	103.8	112.6	106.4	111.4	106.8	100.0	92.8	82.9	4	4
Chemicals and synthetic materials	118.7	114.8	109.1	95.4	109.4	99.4	113.7	108.2	100.0	90.0	77.0	3	4
Basic chemicals	98.7	99.3	95.0	90.6	104.3	107.2	110.1	110.7	100.0	94.8	88.5	−1	1
Alkalies and chlorine	96.9	99.4	91.5	83.3	96.1	104.1	113.6	101.7	100.0	109.9	105.8	−3	−1
Industrial gases	118.6	114.8	114.0	103.9	115.4	105.0	107.2	98.7	100.0	84.3	73.3	3	5
Inorganic pigments	91.6	93.1	91.5	81.7	99.0	97.6	100.8	103.5	100.0	109.2	105.2	−2	−1
Inorganic chemicals, nec	96.6	97.4	92.9	90.9	104.6	109.4	111.1	115.3	100.0	92.4	86.5	−1	1
Industrial organic chemicals	110.3	107.0	104.0	90.3	105.5	89.1	108.1	104.5	100.0	88.5	72.2	3	4
Synthetic materials	149.1	140.3	129.0	108.0	120.2	110.1	125.8	112.2	100.0	89.2	77.0	6	7
Plastics materials	197.3	179.8	158.7	129.9	136.1	122.1	132.6	115.6	100.0	86.7	70.5	10	11
Synthetic rubber	95.4	107.6	98.3	86.8	91.2	93.0	112.1	99.0	100.0	98.9	86.7	−11	1
Man-made fibers	95.1	94.1	95.4	82.9	104.6	97.3	119.4	110.2	100.0	89.8	80.8	1	2
Chemical products	140.5	132.5	123.2	114.7	116.5	113.7	110.1	106.7	100.0	95.4	87.3	6	5
Drugs and medicines	120.9	119.1	118.8	114.2	112.0	112.9	107.5	105.1	100.0	95.9	87.6	2	3
Soap and toiletries	175.6	156.7	139.9	125.4	129.6	121.5	115.0	106.6	100.0	96.3	88.1	12	7
Paints	101.9	102.6	90.1	83.5	86.7	89.7	95.0	104.7	100.0	94.8	90.5	−1	1
Agricultural chemicals	95.7	98.2	86.9	90.2	109.2	107.3	103.9	97.5	100.0	92.5	90.8	−3	1
Petroleum products	86.8	87.4	84.0	84.2	89.4	94.0	101.7	102.5	100.0	92.8	87.3	−1	0
Rubber and plastics products	146.9	143.2	124.3	110.2	116.4	107.8	114.9	107.5	100.0	84.9	73.3	3	7

nec = not elsewhere classified. Source: Federal Reserve Board

MINERALS: Output of most decreases in 1985

Thousands of tons	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	Annual change 1984–85	Annual change 1975–85
Bromine, sold or used[a]	175[b]	193	185	200	189	189	249	223	217	230	204	−9%	−2%
Calcium chloride, production[c,d]	801[b]	1,036	912	853	917	811	981	1,031	968	897	828	−23	0
Iodine, consumption[e,f]	na	3.8[b]	4.1	3.4	4.4	4.4	4.4	4.0	4.3	3.6	3.1	na	na
Imports[f]	2.5[b]	2.6	3.1	2.3	3.0	3.1	3.1	3.4	3.5	3.2	2.7	−4	−1
Lime, sold or used[g]	15,800[b]	15,922	14,867	14,075	18,890	19,037	20,983	20,484	19,987	20,257	19,159	−1	−2
Lithium, consumption[e,h]	3.5[b]	3.2	2.2	2.0	3.2	3.0	3.2	3.4	4.1	2.8	2.9	9	2
Phosphate rock													
Marketable production	56,035	54,230	46,928	41,241	59,110	59,982	56,891	55,156	52,091	49,231	48,806	3	1
Exports	11,931	12,707	13,239	10,849	11,458	15,737	15,827	14,187	14,584	10,398	12,270	−6	0
Potash (K_2O equivalent)[i]													
Production	1,461[b]	1,724	1,575	1,967	2,377	2,468	2,453	2,484	2,457	2,400	2,501	−15	−5
Imports[j]	5,323[b]	5,319	4,894	4,253	5,287	5,481	5,693	5,189	5,076	4,594	3,797	0	3
Apparent consumption	6,373[b]	6,638	6,231	5,647	6,849	6,999	7,626	6,840	6,605	6,149	5,113	−4	2
Salt, total sold or used[k]	39,700[b]	39,225	34,573	37,894	38,915	40,396	45,820	42,696	43,439	44,218	41,057	1	0
Evaporated[l]	5,955[b]	5,492	5,532	5,305	6,209	6,358	6,248	5,872	5,704	5,634	5,372	8	1
Rock[l]	13,895[b]	13,337	12,446	12,884	11,871	11,806	14,891	14,688	14,958	15,668	14,283	4	0
Salt in brine[l]	19,850[b]	20,397	16,595	19,705	20,835	22,231	24,681	22,336	22,777	22,917	21,401	−3	−1
Sodium carbonate, production[d]	8,500[b]	8,511	8,467	7,819	8,281	8,275	8,253	8,290	8,040	7,560	7,130	0	2
Sulfur, production[m]	12,511[b]	11,742	10,240	10,788	13,388	13,080	13,339	12,318	11,824	11,992	12,610	7	0
Apparent consumption[n]	13,228[b]	13,976	12,112	11,088	14,093	15,056	15,145	13,889	12,850	12,060	11,875	−5	1
Frasch, production	5,512[b]	4,622	3,530	4,641	6,997	7,044	7,007	6,226	6,520	7,016	8,077	19	−4
Recovered elemental, production	5,677[b]	5,747	5,462	4,855	4,695	4,490	4,486	4,478	3,995	3,514	3,326	−1	5
Other, production	1,323[b]	1,372	1,249	1,293	1,695	1,547	1,845	1,615	1,310	1,462	1,208	−4	1

a Elemental bromine sold as such or used in preparation of bromine compounds by primary producers. b Preliminary figure. c 75% $CaCl_2$ equivalent. d Natural and synthetic. e Estimated apparent consumption. f Crude elemental iodine. g Includes Puerto Rican production. h Lithium content basis. i Includes muriate and sulfate of potash, potassium magnesium sulfate, and parent salts; excludes other chemical compounds containing potassium. j Includes nitrate of potash. k Total obtained by all recovery methods that was sold or used by domestic producers (figures differ slightly from U.S. production figures); figures for 1973–81 include Puerto Rican production. l Sold or used as such. m Sulfur content basis. n Calculated from shipments plus imports minus exports (sulfur content basis). na = not available. Source: Bureau of Mines

ORGANIC CHEMICALS: Production declines more often than it rises last year

Millions of lb unless otherwise noted	Production											Annual change	
	1985[a]	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1984–85	1975–85
Acetic acid, synthetic	2,875	2,619	2,807	2,748	2,705	2,977	3,265	2,776	2,570	2,463	2,197	10%	3%
Acetone	1,801	1,862	1,859	1,694	2,144	2,076	2,653	2,519	2,219	1,869	1,640	−3	1
Acrylonitrile	2,346	2,219	2,146	2,035	1,997	1,830	2,018	1,752	1,646	1,518	1,215	6	7
Aniline	758	786	663	557	634	659	690	606	584	544	407	−4	6
Benzene, mg[b,c]	1,321	1,318	1,232	1,052	1,308	1,534	1,612	1,435	1,371	1,365	959	0	3
Bisphenol A	802	762	643	480	555	530	576	471	455	449	293	5	11
1,3-Butadiene[d]	2,525	2,452	2,353	1,915	2,986	2,799	3,583	3,515	3,259	3,507	2,597	3	0
1-Butanol	728	908	833	730	809	790	766	756	660	625	490	−20	4
Caprolactam	1,083	1,027	977	793	928	905[e]	945	919	867	780	713	5	4
Carbon tetrachloride	624	713	573	587	726	710	714	737	809	857	906	−12	−4
Chloroform	385	405	362	299	405	273	356	349	302	292	262	−5	4
Cumene	3,328	3,754	3,345	2,743	3,309	3,459	3,917	3,380	2,644	2,716	2,003	−11	5
Cyclohexane	1,742	1,994	1,656	1,275	1,820	1,964	2,425	2,332	2,265	2,187	1,734	−13	0
Dioctyl phthalate	267	301	300	266	304	353	336	409	400	413	312	−11	−2
Dodecylbenzene[e]	na	561	545	509	535	563[f]	627	526	526	529	495	na	na
Ethanol, synthetic	647	1,060	1,077	1,023	1,317	1,451	1,408	1,267	1,339	1,496	1,429	−39	−8
Ethanolamines[g]	538	504	468	416	429	376	420	362	308	286	258	7	8
Ethylbenzene	8,547	7,562	7,876	6,656	7,813	7,642	8,448	8,385	8,312	5,770	4,822	13	6
Ethyl chloride	182	290	282	339	324	396	582	540	612	669	575	−37	−11
Ethylene	30,550	31,383	28,680	24,501	29,418	28,667	29,904	25,955	25,172	22,475	20,499	−3	4
Ethylene dichloride	13,632	10,710	11,506	7,619	9,974	11,108	11,794	11,001	10,997	8,042	7,977	27	6
Ethylene glycol	4,679	4,823	4,425	4,309	4,143	4,386	4,729	3,904	3,675	3,335	3,809	−3	2
Ethylene oxide	5,833	5,699	5,534	4,987	4,937	5,220	5,665	5,012	4,364	4,184	4,467	2	3
2-Ethylhexanol	513	541	387	325	389	367	318	420	493	450	387	−5	3
Formaldehyde, 37%[h]	5,699	5,815	5,465	4,817	5,721	5,555	5,971	6,381	6,046	5,449	4,558	−2	2
Isopropyl alcohol	1,118	1,394	1,209	1,380	1,669	1,836	1,900	1,730	1,888	1,936	1,521	−20	−3
Maleic anhydride	372	359	299	260	293	304	323	341	294	264	216	4	6
Methanol, synthetic	5,979	8,186	7,982	7,555	8,577	7,153	7,367	6,443	6,453	6,242	6,242	−27	0
Methyl chloride	410	482	409	366	405	362	463	454	476	378	378	−15	1
Methyl ethyl ketone	537	543	531	468	614	692	716	644	635	631	631	−1	−2
Methyl methacrylate	858	917	844	721	592	564	633	570	478	538	497	−6	6
Methylchloroform	592	675	586	595	611	587	656	661	512	428	425	−12	3
Methylene chloride	581	607	584	532	891	780	931	na	745	na	546	−4	1
Perchloroethylene	493	573	547	585	691	765	773	725	614	669	679	−14	−3
Phenol, synthetic[i]	2,777	2,889	2,638	2,023	2,578	2,568	2,981	2,682	2,338	2,121	1,746	−4	5
Phthalic anhydride	836	870	838	684	870	818	1,013	978	926	902	702	−4	2
Propylene[j]	14,930	15,559	13,959	12,535	13,482	13,676	14,198	13,014	13,328	10,030	8,709	−4	6
Propylene glycol	538	462	484	400	473	488	610	547	489	517	391	16	3
Styrene, monomer	7,454	7,709	6,802	5,942	6,679	6,856	7,484	7,186	6,867	6,301	4,673	−3	5
Terephthalic acid, dimethyl ester[k]	7,165	5,912	5,626	4,843	6,235	6,054	6,159	5,954	5,410	5,051	4,614	21	4
Toluene, mg[b,l]	688	728	780	714	852	1,010	1,001	1,046	1,008	990	695	−5	0
Vinyl acetate	2,112	2,024	1,963	1,876	1,936	1,922	1,982	1,692	1,586	1,481	1,290	4	5
Vinyl chloride	7,775	6,084	6,875	4,902	6,874	6,466	6,389	6,941	5,986	5,677	4,196	28	6
***o*-Xylene**	697	688	781	802	918	995	1,082	1,013	985	854	703	1	0
***p*-Xylene**	4,724	4,264	4,114	3,391	4,532	4,238	4,650	3,516	3,172	2,911	2,484	11	7

a Preliminary. b Tar distillers and coke-oven operators not included. c Specification grades. d Rubber grade. e Includes straight-chain dodecylbenzene, tridecylbenzene, and other straight-chain alkylbenzenes. f Preliminary figure, final figure not available. g Mono-, di-, and triethanolamines. h By weight. i Does not include data for coke ovens and gas-retort ovens. j All grades. k Includes both acid and dimethyl ester (DMT), without double counting. l High-purity toluene, includes material used in blending motor fuel. mg = millions of gallons. na = not available.
Source: International Trade Commission

INORGANICS: Output of most chemicals decreases or grows only a little

Thousands of tons unless otherwise noted	Production										Annual change	
	1985[a]	1984	1983	1982	1981	1980	1979	1978	1977	1976	1984–85	1975–85
Aluminum sulfate[b]	1,003	1,129	1,119	1,154	1,294	1,288	1,315	1,309	1,255	1,202	1,146	−11%	−1%
Ammonia,[c,d] 100%	16,201	16,692	14,072	15,801	19,044	19,653	18,634	17,119	17,765	16,716	16,419	3	0
Ammonium nitrate,[e] 100%	6,906	7,146	6,240	7,091	8,861	9,128	8,293	7,210	7,177	7,186	7,088	3	0
Ammonium sulfate,[d,f] 100%	2,049	2,067	1,956	1,768	2,185	2,136	2,363	2,449	2,264	2,010	2,106	−1	0
Chlorine gas[g]	10,465	10,700	9,960	9,176	10,763	11,421	12,291	11,052	10,573	10,378	9,167	−2	1
Hydrochloric acid,[h] 100%	2,777	2,732	2,468	2,450	2,574	2,888	3,090	2,793	2,668	2,542	2,009	2	3
Hydrogen,[i,j] bcf, 100%	107	109	103	88	105	107	106	90	85	82	74	−2	4
Nitric acid,[k] 100%	7,778	7,726	6,768	7,390	9,093	9,231	8,916	7,934	7,987	7,791	7,527	1	0
Nitrogen gas,[i,j] bcf, 100%	647	661	560	483	490	479	427	379	328	289	252	−2	10
Oxygen, bcf,[i,j] 100%	385	375	346	349	431	431	456	430	392	388	353	3	1
Phosphoric acid, 100% P_2O_5	10,492	11,370	9,767	8,253	9,958	10,848	10,318	9,637	8,745	7,949	7,677	−8	3
Phosphorus[m]	359	386	366	361	426	432	460	441	430	437	450	−7	−2
Sodium chlorate, 100%	259	295	323	291	297	312	269	265	251	199	173	−12	4
Sodium hydroxide, 100%	10,959	10,914	10,039	9,385	10,621	11,625	12,759	11,309	11,000	10,516	9,635	0	1
Sodium phosphate[n]	607	675	669	651	696	727	757	739	717	724	770	−10	−2
Sodium silicate[o]	737	685	710	664	771	805	813	829	760	747	724	8	0
Sodium sulfate,[p] 100%	1,203	901	914	864	1,111	1,140	1,121	1,174	1,199	1,232	1,227	33	0
Sulfuric acid,[q] 100%	39,615	41,802	36,583	33,233	40,742	44,158	43,204	41,314	38,337	34,878	32,360	−5	2
Titanium dioxide,[r] 100%	814	835	760	660	761	727	742	701	687	715	603	−3	3
Urea	6,556	7,433	6,137	6,470	8,062	7,830	7,000	6,273	5,072	4,498	3,799	−12	6

a Preliminary. b Commercial, 17% Al_2O_3; includes municipalities. c Synthetic anhydrous. d Excludes by-product ammonia liquor and ammonium sulfate. e Original solution. f Synthetic and noncoke by-product. g Includes quantities liquefied for use, storage, or shipment. h Includes anhydrous hydrochloric acid production. i High- and low-purity gas. j Liquid and gas; excludes amounts vented and used as fuel, and amounts produced in petroleum refineries for captive use. k Includes unspecified amounts of nitric acid produced but not withdrawn from the system. l Excludes amounts produced and consumed in making synthetic ammonia or ammonia derivatives. m Elemental, white (yellow), and red. n Tripolyphosphate (100% $Na_5P_3O_{10}$). o Soluble silicate glass (water glass), solid and liquid (anhydrous); excludes amounts produced and consumed in making meta-, ortho-, and sesquisilicates. p Anhydrous, high and low purity, and Glauber's salt. q Gross (new and fortified). r Composite and pure. **Note:** bcf = billions of cubic feet. **Sources:** Department of Commerce, International Trade Commission

MAN-MADE FIBERS: Only olefins show any growth

Man-made noncellulosic fibers output

Millions of lb	Production										Annual change	
	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1984–85	1975–85
NONCELLULOSIC FIBERS													
Acrylic[a]	631	671	671	624	691	779	761	726	709	621	525	−6%	2%
Nylon	2343	2412[b]	2419[b]	1927	2332	2358	2,720	2550	2326	2075	1857	−3	2
Olefins[c]	1249	997	906	723	785	748	759	692	635	577	497	25	10
Polyester	3341	3392	3544	3169	4176	3989	4,178	3800	3642	3340	2995	−2	1
CELLULOSIC FIBERS													
Acetate[d]	558	199	229	196	261	316	324	308	290	298	313	na	na
Rayon		421	401	388	509	490	606	597	598	543	436	na	na
GLASS FIBER	na	1394	1168	899	1041	867	1,014	923	787	673	548	na	na
TOTAL	na	9486	9338	7926	9795	9547	10,362	9596	8987	8130	7169	na	na

a Includes modacrylic. b Excludes aramid in 1983 and 1984. c Includes olefin yarn and monofilaments and olefin and vinyon staple and tow. d Includes diacetate and triacetate; excludes production for cigarette filters. na = not available. **Note:** Totals may not add because of rounding. **Source:** Textile Economics Bureau

1 Production by the U.S. Chemical Industry

Plastics production

Billions of lb

PLASTICS: Strong growth in thermoplastics leads to new output high

Millions of lb[a]	Production											Annual change	
	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1984–85	1975–85
THERMOSETTING RESINS													
Epoxy[b]	385	406	334	286	336	315	361	299	261	244	198	−5%	7%
Polyester[c]	1,223	1,232	1,084	865	997	947	1,147	1,209	1,067	1,042	834	−1	4
Urea	1,210	1,199	1,172	998	1,165	1,165	1,367	1,122	963	821	690	1	6
Melamine	192	210	180	158	179	167	200	202	200	186	115	−9	5
Phenolic[d]	2,621[e]	2,502[e]	2,477[e]	2,006[e]	2,333[e]	1,499	1,781	1,617	1,458	1,340	1,051	5	nc
TOTAL	5,631	5,549	5,247	4,313	5,010	4,093	4,856	4,449	3,943	3,633	2,888	1%	nc
THERMOPLASTIC RESINS													
Polyethylene													
Low density[f]	6,889	8,413	8,041	7,503	7,693	7,291	7,793	7,111	6,471	5,813	4,743	6%	6%
High density[g]	6,671	6,085	5,689	4,928	4,695	4,405	5,010	4,201	3,652	3,125	2,468	10	10
Polypropylene	5,139	4,940	4,433	3,477	3,955	3,648	3,841	3,074	2,747	2,632	1,902	4	10
Styrene-acrylonitrile	87	99	93	91	107	111	124	120	115	113	109	−12	−2
Polystyrene	4,054	3,838	3,570	3,191	3,621	3,521	4,005	3,823	3,446	3,195	2,662	6	4
Acrylonitrile-butadiene-styrene and other styrene polymers[h]	2,036	2,127	1,889	1,380	1,745	1,705	2,107	2,012	1,882	1,744	1,227	−4	5
Polyamide, nylon type	399	396	321	228	312	274	327	275	254	247	135	1	11
Polyvinyl chloride and copolymers	6,772	6,760	6,067	5,326	5,707	5,470	6,119	5,723	5,253	4,716	3,648	0	6
Other vinyl resins[i]	190	187	186	177	208	196	220	197	197	225	187	2	0
TOTAL	34,237	32,845	30,289	26,301	28,043	26,621	29,546	26,536	24,017	21,810	17,081	4%	7%

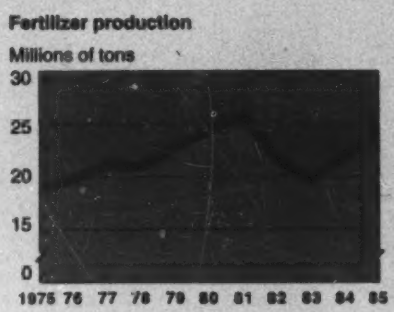
a Dry-weight basis unless otherwise specified. b Unmodified. c Unsaturated. d Includes other tar acid resins. e Gross-weight basis. f Density 0.940 and below. g Density above 0.940. h Includes styrene-butadiene copolymers and other styrene-based polymers. i Includes polyvinyl butyral, polyvinyl formal, and polyvinylidene chloride. nc = not comparable. Note: Totals are for those products listed and exclude some small-volume plastics. Source: Society of the Plastics Industry

SYNTHETIC RUBBER: Total output declines 12% in 1985

Thousands of metric tons	Production											Annual change	
	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1984–85	1975–85
Styrene-butadiene rubber[a]	805	958	904	876	1032	1074	1378	1395	1395	1333	1179	−16%	−4%
Polybutadiene	329	359	333	288	342	311	397	378	361	352	290	−8	1
Nitrile	55	67	55	45	66	63	75	73	70	73	55	−18	0
Ethylene-propylene	215	215	175	123	178	144	175	174	158	130	84	0	10
Other[b]	503	556	468	498	404	423	509	453	432	415	332	−10	4
TOTAL	1907	2155	1935	1830	2022	2015	2534	2473	2416	2303	1940	−12%	0%

a Excludes high-styrene latex. b Includes butyl, polychloroprene, polyisoprene, silicone, and other synthetic elastomers. Some values are estimated. Source: Rubber Manufacturers Association

FERTILIZERS: Nitrogen and phosphate production up strongly in U.S.



Note: Total U.S. production of nitrogen, phosphate, and potash fertilizer. Years ending June 30.
Source: Department of Agriculture

Thousands of tons	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	Annual change 1984–85	Annual change 1975–85
NITROGEN (N)													
Domestic production	12,532	10,364	9,855	11,598	13,036	12,323	11,106	10,466	10,789	10,572	9343	21%	3%
Imports	3,598	3,940	2,654	2,531	2,455	2,566	2,165	1,866	1,642	1,218	1198	−9	12
Exports	3,227	2,080	2,074	2,499	3,088	2,641	2,468	1,778	1,251	1,239	1115	55	11
Domestic supply	12,903	12,224	10,435	11,630	12,403	12,248	10,803	10,554	11,380	10,551	9426	6	3
PHOSPHATE (P_2O_5)													
Domestic production	10,666	9,611	8,043	7,818	10,471	10,012	9,432	8,245	7,793	7,199	7230	11	4
Imports	141	121	133	193	250	239	236	229	245	221	274	17	−6
Exports	5,547	4,352	3,916	3,751	4,381	3,925	3,848	3,290	2,501	2,175	1860	27	12
Domestic supply	5,260	5,380	4,260	4,260	6,340	6,326	5,820	5,184	5,537	5,245	5644	−2	−1
POTASH (K_2O)													
Domestic production	1,413	1,653	1,859	1,831	2,262	2,474	2,519	2,176	2,584	2,313	2287	−15	−5
Imports	5,355	5,164	4,402	4,797	5,487	5,403	5,085	4,948	4,955	3,910	3847	4	3
Exports	588	528	624	641	876	1,048	999	1,003	994	911	848	11	−4
Domestic supply	6,180	6,289	5,637	5,987	6,873	6,829	6,605	6,121	6,545	5,312	5286	−2	2

Note: Years ending June 30. Source: Department of Agriculture

NITROGEN: Output climbs to highest level in a decade

Thousands of tons (N)	Production 1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	Annual change 1984–85	Annual change 1975–85
Ammonia[a]	5,255	4,179	3587	5,032	5,348	5,270	4,603	4,063	4,307	4,594	3995	26%	3%
Ammonium nitrate[b,c]	836	913	943	1,105	1,157	1,096	1,137	1,044	1,169	1,265	1210	−8	−4
Ammonium sulfate[c]	484	517	395	432	502	521	509	497	547	562	504	−6	0
Urea	1,999	1,786	1692	1,684	1,383	1,572	1,201	1,001	937	941	568	12	13
All other	3,958	2,969	3238	3,345	3,964	3,864	3,656	3,871	3,829	3,210	3066	33	3
TOTAL	12,532	10,364	9855	11,598	12,354	12,323	11,106	10,476	10,789	10,572	9343	21%	3%

a Includes aqueous solutions. b Includes ammonium nitrate-limestone mixtures. c Adjusted for estimated quantity going into nonfertilizer uses. Note: Years ending June 30. Source: Department of Agriculture

PHOSPHATE: Production increases for third straight year

Thousands of tons (P_2O_5)	Production 1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	Annual change 1984–85	Annual change 1975–85
Ammonium phosphate[a]	6,525	6156	5026	4434	6,243	5,519	5082	4548	4118	3380	2572	6%	10%
Concentrated superphosphate	1,145	1172	1184	1151	1,694	1,737	1901	1768	1750	1662	1569	−2	−3
Normal and enriched superphosphate	102	113	110	153	376	384	320	303	376	414	612	−10	−16
All other	2,894	2170	1723	2080	2,613	2,372	2129	1626	1549	1743	2477	33	2
TOTAL	10,666	9611	8043	7818	10,926	10,012	9432	8245	7793	7199	7230	11%	4%

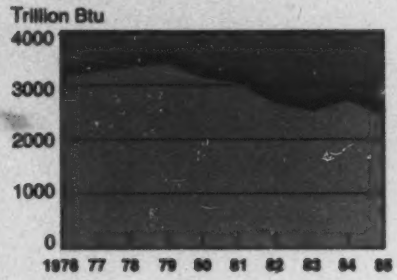
a Liquid and solid, excluding that combined with potash salts in the process of manufacture. Note: Years ending June 30. Source: Department of Agriculture

POTASH: Production continues to dwindle

Thousands of tons (K_2O)	Production											Annual change	
	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1984–85	1975–85
Potassium chloride	1107	1248	1456	1383	2007	1874	2082	1770	2098	1893	1853	−11%	−5%
Potassium sulfate	271	370	368	413	481	565	402	371	451	385	399	−27	−4
All other	35	35	35	35	35	35	35	35	35	35	35	0	0
TOTAL	1413	1653	1859	1831	2523	2474	2519	2176	2584	2313	2287	−15%	−5%

Note: Years ending June 30. Source: Department of Agriculture

Total energy consumption



ENERGY USE BY CHEMICAL INDUSTRY: Total use declines, led by petroleum-based fuels

Energy source[a]	1985		1984		1983		1982		1972		Change 1972–85	
	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	%
Natural gas	973	37.8%	1049	37.1%	1010	37.6%	1051	38.7%	1530	47.1%	−557	−36.4%
Purchased electricity[b]	775	30.1	836	29.5	814	30.3	811	29.9	723	22.3	52	7.2
Petroleum-based fuels	441	17.2	543	19.2	458	17.1	472	17.4	566	17.4	−125	−22.1
Light hydrocarbons[c]	320	12.4	332	11.7	308	11.4	325	12.0	310	9.5	10	3.2
Residual fuels	49	1.9	65	2.3	91	3.4	88	3.2	160	4.9	−111	−69.4
Distillate fuels	12	0.5	13	0.5	12	0.4	14	0.5	33	1.0	−21	−63.6
Other fuel[d]	60	2.3	133	4.7	48	1.8	45	1.7	63	1.9	−3	−4.8
Coal and coke	302	11.8	312	11.0	320	11.9	295	10.9	325	10.0	−23	−7.1
Purchased steam	80	3.1	92	3.2	85	3.2	83	3.1	107	3.3	−27	−25.2
TOTAL	2570	100.0%	2831	100.0%	2688	100.1%	2712	100.0%	3251	100.1%	−681	−20.9%

a For energy and process use only, excluding energy equivalent of feedstock. b Electricity is calculated as fuel value of 10,000 Btu to generate 1 kWh instead of using standard conversion factor of 3412 Btu per kWh. c Includes propane, liquefied petroleum gas, and other gases. d Includes petroleum coke, gasoline, and other liquids and solids. Note: Data from companies accounting for about 90% of U.S. capacity for basic industrial chemicals. Source: Chemical Manufacturers Association

ENERGY USE BY FERTILIZER INDUSTRY: Little change during past year

Energy source[a]	1985		1984		1983		1982		1972		Change[b] 1972–1985	
	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	% of total	Trillion Btu	%
Natural gas	159.9	79.3%	160.0	78.3%	125.6	77.6%	151.8	76.8%	161.3	79.3%	−1.4	−0.9%
Purchased electricity[c]	38.6	19.1	38.7	18.9	31.9	19.7	33.7	17.1	35.3	17.4	3.3	9.3
Petroleum-based fuels	1.0	0.5	2.8	1.4	0.4	0.3	4.4	2.3	8.2	3.1	−3.5	−83.9
Residual fuels	0.6	0.3	2.2	1.1	0.4	0.2	4.4	2.2	3.8	1.9	−3.2	−84.2
Other fuel[d]	0.4	0.2	0.6	0.3	0.1	0.1	0	0	2.4	1.2	0.4	−83.3
Coal and coke	na	na	na	na	na	na	na	na	0.5	0.2	na	na
Generated steam[e]	2.1	1.1	2.8	1.4	3.9	2.4	7.6	3.8	na	na	na	na
Purchased steam	0	0	0	0	0	0	0	0	0.1	0	−0.1	−100
TOTAL	202	100.0%	204.3	100.0%	161.8	100.0%	197.6	100.0%	203.3	100.0%	−1.3	−0.6%

a For energy and process use only, excluding energy equivalent of feedstock. b Data for 1984 and 1985 cover 21 firms, but one firm is not included in 1972 base owing to unavailability of data because of corporate realignment. c Electricity is calculated as fuel value of 10,000 Btu to generate 1 kWh instead of using standard conversion factor of 3412 Btu per kWh. d Includes propane, liquefied petroleum gas, gasoline, diesel oil, kerosine, distillate fuel oil, and other fuels. e Steam generated from fossil fuel, listed prior to 1982 under residual fuels, other fuel, and coal and coke. na = not available. Note: Data from companies accounting for more than 70% of U.S. ammonia capacity. Source: Fertilizer Institute

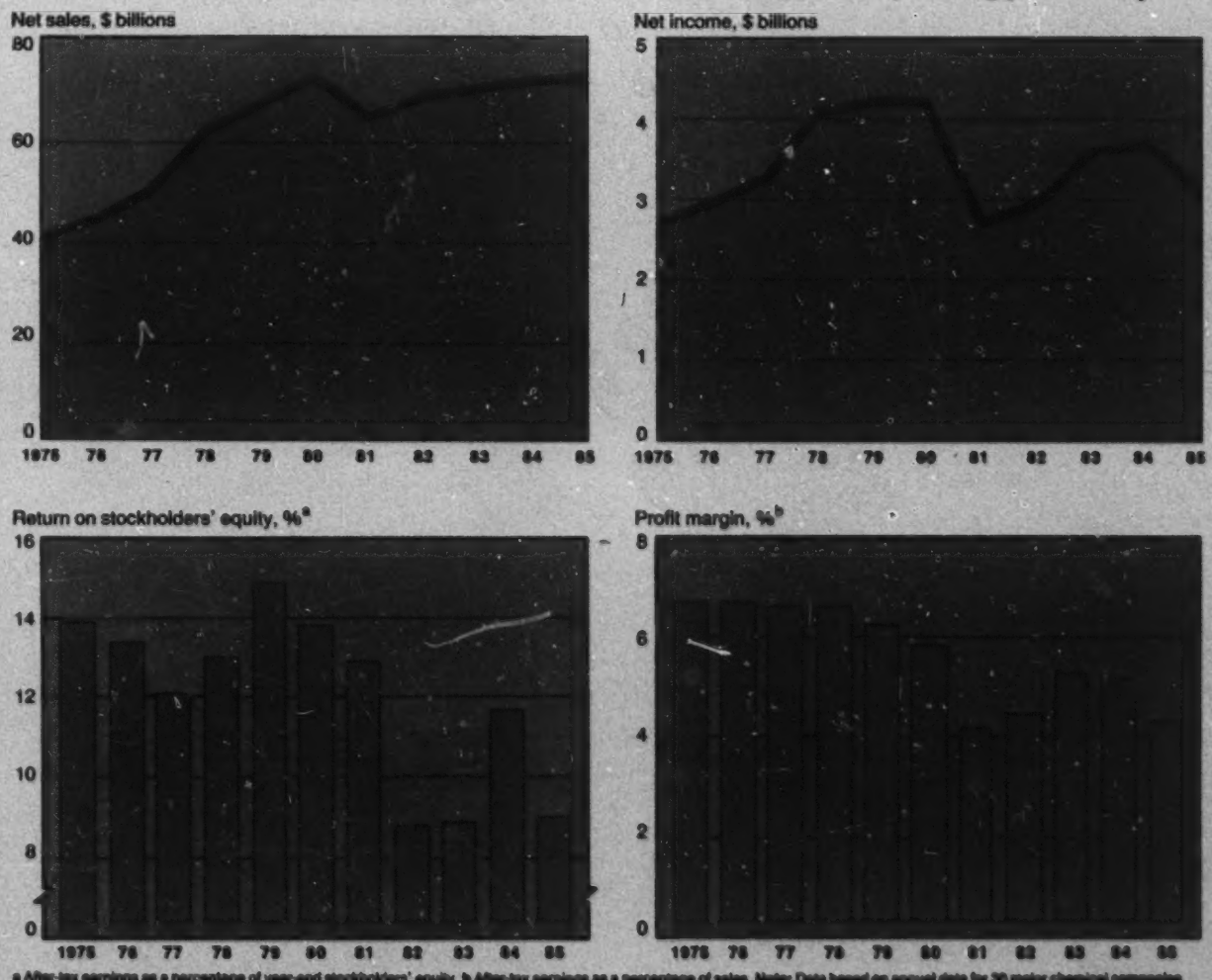
Earnings, profitability decline in 1985

Sales for the U.S. chemical industry hit a plateau in 1985. And companies in the industry probably wish that earnings and profitability had followed suit. However, both fell from the year before.

The chemical industry was plagued throughout much of the year by a strong dollar, compared with other currencies, that undercut export markets and made foreign products more competitive in the U.S. Imported chemicals not only cut into domestic markets, but in many cases put pressure on prices of U.S. chemicals and stalemated any possibility of increased earnings for U.S. chemical producers. Man-made fibers are a case in point. In addition, some domestic chemical markets, notably agriculture, were weak, resulting in huge drains on earnings for producers of farm chemicals.

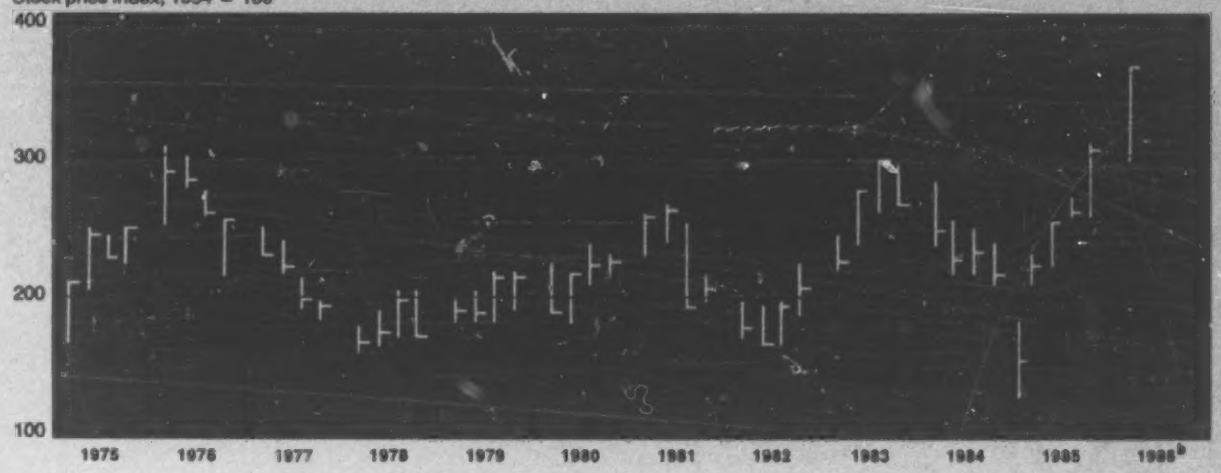
As a result, sales for the year were flat, but earnings fell 16% from the year before. In 1985, therefore, chemical profitability lost much of the ground it had gained in the past couple of years. Profit margins last year fell to 3.1% of sales from 3.7% the year before. And return on equity declined to 9.0% from 11.7% in 1984.

Sales were flat in 1985 for chemical producers, while earnings fell, squeezing profitability



a After-tax earnings as a percentage of year-end stockholders' equity. b After-tax earnings as a percentage of sales. Note: Data based on annual data for 30 major chemical companies.

Chemical stock prices soar during past year



a C&EN weighted stock price index of American Cyanamid, Celanese, Dow Chemical, W. R. Grace, Hercules, Monsanto, and Union Carbide; weighted according to number of shares outstanding for each company. b First quarter.

SHIPMENTS: Growth for chemicals is less than for industry as a whole

$ Billions	1985[a]	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	Annual change 1984–85	Annual change 1975–85
All manufacturing industries	$2341.2	$2274.9	$2047.4	$1910.1	$1994.6	$1851.0	$1727.2	$1523.4	$1358.4	$1185.6	$1039.1	3%	8%
Chemicals and allied products	214.3	211.8	190.2	172.8	175.1	161.6	147.7	129.8	118.2	104.1	89.7	1	9
Industrial chemicals[b]	71.6	68.7	59.1	55.8	60.7	56.4	52.3	44.8	41.5	35.6	29.4	4	9
Drugs, soap, and toiletries	56.1	53.9	50.4	48.6	44.1	41.9	36.7	34.7	30.6	27.8	24.3	4	9
Petroleum and coal products	194.0	200.6	191.6	206.4	220.3	196.7	148.4	103.9	97.5	82.3	69.5	−3	11
Rubber and plastic products, nec	48.2	52.1	50.3	50.2	46.5	47.3	46.8	43.2	39.6	31.8	27.2	−7	6
Paper and allied products	97.6	95.9	85.1	79.0	79.5	72.6	65.2	57.0	52.1	48.2	41.7	2	9

a Preliminary. b Excluding pigments. nec = not elsewhere classified. Source: Department of Commerce

PRICES: Small increases and some decreases dominate chemical products

Producer price indexes,[a] 1967 = 100	Annual average 1985[b]	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	Annual change 1984–85	Annual change 1975–85
All commodities	308.8	310.3	303.1	299.3	293.4	268.8	235.6	209.3	194.2	183.0	174.9	0%	6%
Industrial commodities	323.9	322.6	315.8	312.3	304.1	274.8	236.5	209.4	195.1	182.4	171.5	0	7
Chemicals and allied products	306.1	300.8	292.9	292.4	287.6	260.3	222.3	198.8	192.8	187.2	181.3	2	5
Industrial chemicals	338.5	341.3	342.9	353.0	363.3	324.0	264.0	225.6	223.9	219.3	206.9	−1	5
Prepared paint	276.8	272.5	264.7	262.9	249.8	235.3	204.4	192.3	182.4	174.4	166.9	2	5
Paint materials	333.8	329.7	305.6	304.6	300.1	273.9	241.2	212.7	205.9	189.8	177.2	1	7
Drugs and pharmaceuticals	256.4	240.0	226.2	210.1	193.5	174.5	159.4	148.1	140.5	134.0	126.6	7	7
Fats and oils, inedible	294.9	371.4	283.7	267.1	295.6	298.0	376.7	315.8	279.0	249.9	255.2	−21	1
Agricultural chemicals and chemical products	281.7	284.8	260.7	292.7	285.0	257.1	214.4	198.4	187.8	188.4	203.6	−1	3
Plastic resins and materials	304.4	308.6	290.2	283.3	289.2	279.2	235.9	199.8	195.7	194.0	180.9	−1	5
Other chemicals and allied products	284.3	277.5	273.7	269.8	254.2	224.5	191.8	181.8	175.7	170.7	168.6	2	5
Rubber and plastics products	245.8	246.8	243.4	241.6	232.6	217.4	194.3	174.8	167.6	159.2	150.2	0	5

a Formerly called "wholesale price indexes." b Preliminary. Source: Department of Labor

TOP 100 CHEMICAL PRODUCERS: Sales and profits from their chemical operations were lower last

Rank 1985	Rank 1984		Chemical sales 1985 ($ millions)	Change from 1984	Chemical sales as % of total sales	Industry classification	Chemical operating profits[a] ($ millions)	Change from 1984	Chemical operating profits as % of total operating profits	Operating profit margin[b]	Identifiable chemical assets ($ millions)	Chemical assets as % of total assets	Operating return on chemical assets[c]
1	1	Du Pont	$11,250	−6.3%	38.2%	Diversified	$870	−21.4%	22.0%	7.7%	$7885	34.3%	11.0%
2	2	Dow Chemical	9,508	−0.9	82.4	Basic chemicals	411	−44.5	64.5	4.3	8047	68.0	5.1
3	3	Exxon	6,670	−2.9	7.3	Petroleum	385	−43.1	3.5	5.8	5337	7.7	7.2
4	4	Monsanto	5,203[d]	−12.6	77.1	Basic chemicals	477	−28.7	135.9	9.2	4217	47.5	11.3
5	5	Union Carbide	3,961	−4.7	44.0	Basic chemicals	413	−14.0	50.0	10.4	4330	44.7	9.5
6	8	Atlantic Richfield	3,804	21.0	16.9	Petroleum	73[e]	−49.3	4.9	1.9	2296	11.3	3.2
7	6	Shell Oil	3,318	−1.9	16.3	Petroleum	165	−39.6	5.2	5.0	3891	14.7	4.2
8	7	Celanese	3,046	−8.5	100.0	Basic chemicals	127	−53.3	100.0	4.2	2809	100.0	4.5
9	10	Amoco	2,905	2.5	10.1	Petroleum	473	35.5	11.5	16.3	2334	9.3	20.3
10	9	W. R. Grace	2,666	0.7	39.5	Specialty chemicals	234	−30.8	58.4	8.2	1997	36.8	11.7
11	34	Chevron	2,611	137.4	6.0	Petroleum	−163	def	def	def	3010	7.7	def
12	32	BASF	2,600[d]	14.0	100.0	Basic chemicals	na	na	na	na	na	na	na
13	11	Eastman Kodak	2,348	−4.7	22.1	Photo equipment	183	−34.9	32.6	7.8	2136	17.6	8.6
14	15	General Electric	2,347	10.9	8.0	Electrical products	466	−0.9	13.2	19.9	3876	14.7	12.0
15	13	Phillips Petroleum	2,266	−3.6	14.5	Petroleum	219	−0.9	8.0	9.7	1315	9.4	16.7
15	14	Mobil	2,266	−3.6	3.7	Petroleum	81	42.1	1.3	3.6	2045	4.9	4.0
17	12	Allied-Signal	2,055	−15.5	22.5	Diversified	195	−15.6	21.8	9.5	1979	14.9	9.9
18	16	Rohm & Haas	1,966	0.2	95.9	Basic chemicals	270	−18.9	99.3	13.7	1381	98.9	19.6
19	17	American Cyanamid	1,830	−3.6	51.8	Basic chemicals	81	−40.2	32.1	4.4	1254	54.6	6.4
20	18	Hercules	1,743	−4.4	67.8	Basic chemicals	47	−63.6	35.9	2.7	1409	53.0	3.3
21	19	Air Products[f]	1,674	4.4	91.5	Basic chemicals	312	6.9	114.3	18.6	1937	74.7	16.1
22	37	Occidental Petroleum	1,621[g]	64.6	10.4	Petroleum	100	45.4	5.5	6.2	1721	14.9	5.8
23	24	Mobay	1,599	3.0	100.0	Basic chemicals	150	11.2	100.0	9.4	1215	100.0	12.4
24	20	Ciba-Geigy	1,540	−1.3	64.2	Specialty chemicals	na	na	na	na	na	na	na
25	26	Borden	1,532	5.8	32.5	Dairy products	129	−24.1	32.4	8.4	1336	47.4	9.6
26	23	Ashland Oil	1,499	−0.1	18.3	Petroleum	68	23.6	19.3	4.5	496	12.6	13.7
27	27	B. F. Goodrich	1,384	−2.8	43.2	Rubber products	79	−30.4	51.1	5.7	1154	51.1	6.9
28	25	American Hoechst	1,361[d]	−7.3	80.4	Basic chemicals	na	na	na	na	na	na	na
29	31	FMC	1,261	2.0	38.7	Machinery	143	−23.5	53.2	11.4	1260	46.8	11.4
30	28	Ethyl	1,242	−9.0	80.3	Basic chemicals	198	4.2	84.3	16.0	768	49.4	25.8
31	21	Texaco	1,220	−20.7	2.6	Petroleum	12	−69.2	0.3	1.0	1010	2.7	1.2
32	28	U.S. Steel	1,217	−9.7	6.3	Steel	−1	def	def	def	587	3.2	def
32	30	Unocal	1,217	−2.6	10.8	Petroleum	58[e]	−33.3	17.8	4.8	772	7.2	7.5
34	33	Olin	1,147	−2.3	65.5	Basic chemicals	46	−24.5	44.3	4.0	825	51.6	5.6
35	—	Chesebrough-Pond's	1,079	nm	40.0	Diversified	60	nm	27.7	5.6	1771	58.9	3.4
36	38	International Minerals[h]	1,057	8.1	61.2	Agrochemicals	135	−7.7	62.8	12.7	1285	65.6	10.5
37	42	National Distillers	1,037	−4.0	45.3	Alcoholic beverages	72	−29.6	37.7	6.9	746	36.9	9.6
38	39	Borg-Warner	929	−1.6	27.9	Auto equipment	122	0.8	35.8	13.2	437	15.5	28.0
39	40	CF Industries	921[d]	1.4	100.0	Agrochemicals	−1	def	def	def	936	100.0	def
40	42	Dow Corning	901	5.4	100.0	Specialty chemicals	95[e]	4.3	100.0	10.6	na	na	na
41	57	National Starch	881	nm	100.0	Specialty chemicals	66	20.0	100.0	7.5	655	100.0	10.1
42	36	PPG Industries	841	−15.3	19.4	Glass products	80	−34.0	17.9	9.5	1129	27.6	7.1
43	46	Reichhold Chemicals	823	2.6	100.0	Basic chemicals	21	−51.6	100.0	2.6	492	100.0	4.3
44	43	Lubrizol	804	−3.4	89.0	Specialty chemicals	93	−8.4	97.5	11.6	603	70.6	15.5
45	44	Williams Cos.	742	−10.7	23.6	Agrochemicals	−16	def	def	def	553	12.8	def
46	45	Diamond Shamrock	736	−10.3	17.9	Petroleum	121	4.4	33.9	16.5	791	17.1	15.3
47	47	Farmland Industries	721	−8.0	24.2	Agricultural supplies	3	−91.5	3.8	0.4	407	31.7	0.7
48	48	Eli Lilly	713	−5.8	21.8	Drugs	88	−18.4	10.7	12.4	812	20.5	10.9
48	59	Cabot[e]	712	31.4	50.6	Specialty metals	88	31.8	43.5	12.4	482	30.2	18.3
50	52	Nalco Chemical	682	2.7	100.0	Specialty chemicals	122	5.6	100.0	17.8	542	100.0	22.4

a Operating profit is sales less administrative expenses and cost of sales. b Operating profit from chemicals as a percentage of chemical sales. c Chemical operating profit as a percentage of identifiable chemical assets. d Chemical sales include significant amounts of nonchemical products. e Chemical net profits. f Fiscal year ended Sept. 30. g Does not include all chemical sales. h Fiscal year ends June 30. i Fiscal year ends Nov. 30. j Fiscal year ends Oct. 31. na = not available. nm = not meaningful. def = deficit.

year for more than half of them

Rank 1985	Rank 1984		Chemical sales 1985 ($ millions)	Change from 1984	Chemical sales as % of total sales	Industry classification	Chemical operating profits[a] ($ millions)	Change from 1984	Chemical operating profits as % of total operating profits	Operating profit margin[b]	Identifiable chemical assets ($ millions)	Chemical assets as % of total assets	Operating return on chemical assets[c]
51	53	Pennwalt	$680	3.8%	67.1%	Basic chemicals	$ 59	13.9%	72.3%	8.7%	$612	63.9%	9.7%
52	41	Koppers	619	−30.1	44.2	Diversified	−62	def	def	def	373	35.0	def
53	54	Morton Thiokol[h]	616	−5.8	33.8	Diversified	90	10.7	37.6	14.6	543	39.7	16.5
54	58	Engelhard	598	6.8	26.4	Specialty metals	62	−6.1	72.9	10.4	528	56.4	11.7
55	70	Enron	581	46.8	5.7	Natural gas	34	−26.6	5.5	5.9	590	6.0	5.8
56	72	Terra Chemicals	574	55.1	100.0	Agrochemicals	na	na	na	na	na	na	na
56	56	Witco	574	−7.9	39.6	Specialty chemicals	57	−12.6	49.5	9.9	265	32.7	21.4
58	63	NL Industries	564	19.3	39.6	Petroleum services	127	33.9	105.8	22.5	397	24.9	32.0
59	50	Standard Oil (Ohio)	552	−21.9	4.0	Petroleum	27	−38.6	0.9	4.9	549	3.0	4.9
60	74	SCM[h]	539[d]	49.4	24.8	Paint	74	99.8	59.5	13.7	483	35.5	15.3
61	—	Vista Chemicals[e]	521	nm	100.0	Basic chemicals	na	na	na	na	na	na	na
62	76	Solvay America	515	nm	100.0	Basic chemicals	na	na	na	na	na	na	na
63	64	Polysar	513	10.6	100.0	Basic chemicals	na	na	na	na	na	na	na
64	62	International Flavors	501	5.1	100.0	Specialty chemicals	118	1.5	100.0	23.5	560	100.0	21.0
65	60	Kerr-McGee	483	−7.1	14.4	Petroleum	47	def	11.9	9.7	567	15.3	8.3
66	68	Liquid Air	459	7.8	84.6	Basic chemicals	58	10.7	94.0	12.6	na	na	na
67	65	H. B. Fuller[i]	457	2.4	100.0	Specialty chemicals	31	−4.5	100.0	6.7	246	100.0	12.5
68	61	Freeport-McMoRan	451	−8.5	62.5	Agrochemicals	105	−4.5	70.3	23.3	215	10.5	48.8
69	55	Merck	450	−29.8	12.7	Drugs	58	−25.4	6.8	13.0	369	7.5	15.8
70	79	Big Three Industries	411	21.1	49.3	Petroleum services	104	38.3	75.8	25.4	594	55.6	17.6
71	81	American Petrofina	405	27.3	16.8	Petroleum	12	−42.1	def	2.9	314	17.9	3.7
72	69	Sun Co.	402	−4.8	2.8	Petroleum	na	na	na	na	na	na	na
73	72	Rhône-Poulenc	400	8.1	100.0	Specialty chemicals	na	na	na	na	na	na	na
74	71	Pfizer	392	6.6	9.7	Drugs	17	260.0	1.8	4.4	400	9.0	4.3
75	78	Tyler	375	8.4	41.1	Diversified chemicals	30	−61.5	0.1	7.9	174	36.7	17.0
76	75	GAF	364	2.0	49.8	Specialty chemicals	93	17.2	81.4	25.4	217	24.7	42.6
77	81	Chemed	336	5.9	90.3	Specialty chemicals	43	3.8	88.6	12.8	159	69.3	27.1
78	77	Mississippi Chemical	325	−6.8	100.0	Farm cooperative	3	−32.3	100.0	0.9	320	100.0	0.9
79	83	Betz Laboratories	319	5.1	100.0	Specialty chemicals	61	0.3	100.0	19.0	254	100.0	23.9
80	84	Vulcan Materials	292	−3.2	30.1	Nonmetallic minerals	24	−48.4	18.8	8.3	na	na	na
81	85	Petrolite[j]	290	2.1	93.9	Specialty chemicals	36	−11.0	106.1	12.4	170	74.4	21.2
82	—	Dexter	281	−2.1	44.4	Specialty materials	28	−8.7	42.2	10.0	150	30.9	18.9
83	86	Great Lakes Chemical	277	−0.5	100.0	Specialty chemicals	45	−19.8	100.0	16.4	na	na	na
84	—	Union Camp	275	−7.0	14.7	Wood products	9	−56.4	7.2	3.2	207	7.8	4.3
84	87	Aluminum Co. of America	271	−0.7	5.3	Nonferrous metals	na	na	na	na	na	na	na
86	87	Ferro	267[d]	−1.9	41.1	Specialty materials	14	−14.4	37.0	5.1	143	36.4	9.6
87	90	Emhart	257	−1.6	14.5	Machinery	19	−17.4	10.6	7.4	132	8.6	14.4
88	91	Kaiser Aluminum	255	2.3	12.6	Nonferrous metals	8	−80.0	def	3.1	275	8.4	2.8
89	93	Stepan	236	0.4	100.0	Specialty chemicals	9	51.3	100.0	3.9	139	100.0	6.6
90	92	Loctite	231	−4.2	100.0	Specialty chemicals	35	−19.0	100.0	15.1	219	100.0	15.9
91	—	Lonza	197	9.0	100.0	Specialty chemicals	na	na	na	na	na	na	na
92	66	Georgia-Pacific	173	−61.2	3.9	Wood products	na	na	na	na	na	na	na
93	95	Essex Chemical	172	−2.2	90.6	Basic chemicals	32	18.5	118.5	18.6	94	66.7	33.9
94	—	Millmaster Onyx	170	0.0	100.0	Specialty chemicals	na	na	na	na	na	na	na
95	99	Sigma-Aldrich	165	19.4	76.7	Specialty chemicals	47	21.0	89.3	28.6	157	84.1	30.1
96	96	Agway	162	−2.7	4.0	Farm cooperative	na	na	na	na	na	na	na
97	97	First Mississippi	151	−8.6	55.2	Agrochemicals	31	11.0	81.4	20.6	68	17.3	45.4
98	—	UGI	117	3.5	19.4	Natural gas	0	−90.0	def	0.1	133	21.4	0.1
99	100	Crompton & Knowles	113	−2.1	48.7	Specialty chemicals	12	−8.2	58.6	11.0	73	55.8	17.2
100	—	Lawter Chemicals	97	−1.7	100.0	Specialty chemicals	13	−38.1	100.0	13.7	84	100.0	15.7

FINANCIAL ANALYSIS: Many analytical measures weaken in 1985

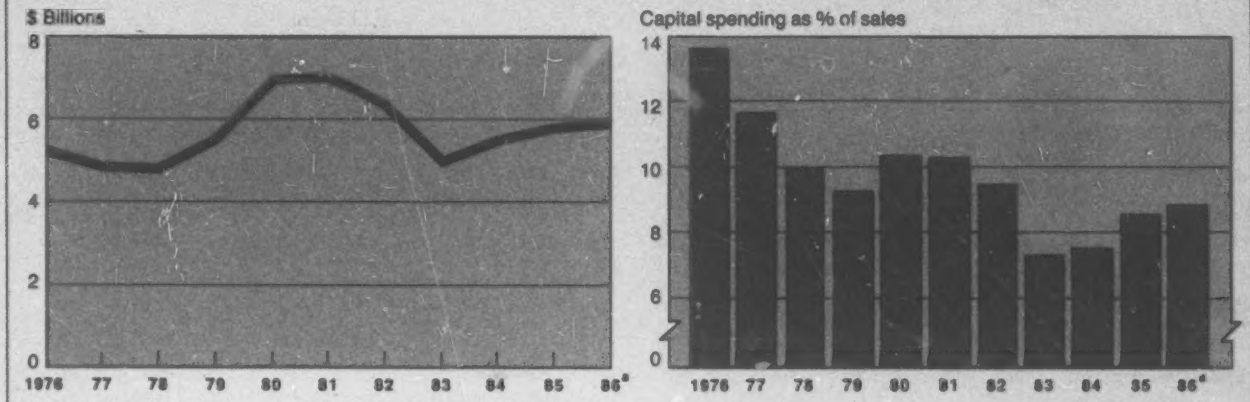
		Profit margin[a]	Return on investment[b]	Debt as % debt plus equity	% total sales abroad[c]	% total assets abroad[d]	Sales per employee[e]	Dividends as % of net income	CAPITAL SPENDING[f] as % of sales	CAPITAL SPENDING[f] as % of net plant	R&D as % of sales	Sales as % of assets	Net plant as % of gross plant
SALES OVER $1 BILLION													
Air Products[g]	1985	7.8%	3.8%	30.9%	17.3%	18.8%	$ 98	26.6%	21.4%	22.0%	2.8%	70.5%	56.1%
	1984	8.1	4.2	25.3	17.4	16.3	98	23.0	15.1	16.5	2.5	74.5	56.9
American Cyanamid	1985	3.4	2.7	25.8	29.6	21.9	97	76.0	5.7	18.0	7.1	103.9	44.3
	1984	5.6	4.8	24.0	30.3	21.7	101	42.2	5.2	16.1	6.1	115.9	45.9
Celanese	1985	5.8	3.8	29.9	20.7	18.0	165	34.3	5.2	13.1	3.4	108.4	34.3
	1984	4.8	3.2	36.2	21.0	18.4	155	41.6	8.3	19.0	3.0	116.0	39.9
Dow Chemical	1985	0.5	0.4	40.0	54.8	46.6	217	587.9	7.0	15.7	4.7	97.5	43.2
	1984	4.8	3.6	35.2	53.6	45.9	229	63.2	6.8	15.1	4.4	100.0	46.0
Ethyl	1985	7.6	7.5	33.6	28.3	9.2	147	31.7	5.8	16.1	3.0	99.4	50.6
	1984	7.9	8.4	36.4	24.5	10.5	152	25.0	6.2	18.0	2.4	113.1	51.4
B. F. Goodrich	1985	0.3	0.3	41.7	15.4	15.1	122	374.5	6.3	19.4	2.0	141.6	55.1
	1984	1.8	1.8	34.9	15.4	12.8	116	62.5	4.6	11.7	1.8	129.6	55.6
W. R. Grace	1985	2.5	1.9	38.8	25.4	16.4	58	111.7	6.7	13.4	1.8	95.8	57.1
	1984	2.9	3.0	40.7	18.9	14.0	84	69.8	5.6	14.1	1.2	126.3	59.3
Hercules	1985	5.1	4.4	26.5	25.0	14.9	102	64.9	9.1	23.4	2.9	97.3	50.1
	1984	7.7	6.8	23.5	26.3	13.2	98	40.1	8.5	24.1	2.8	107.6	46.8
International Minerals[h]	1985	7.3	4.4	23.9	17.3	8.3	187	59.5	7.1	10.3	na	83.1	52.3
	1984	7.3	4.2	27.2	20.5	8.8	170	62.3	6.8	9.2	na	78.0	55.5
Monsanto	1985	2.7	1.8	38.0	28.5	18.8	120	102.7	9.6	21.3	8.1	76.0	44.4
	1984	6.6	4.6	18.5	26.6	20.6	132	41.5	9.2	18.2	6.7	105.0	48.8
Morton Thiokol	1985	6.5	8.6	17.8	13.3	13.1	102	25.7	6.4	20.9	1.8	133.9	70.2
	1984	5.5	8.3	19.0	14.1	12.7	108	26.3	4.5	17.2	1.5	154.1	69.6
National Distillers	1985	3.4	3.3	23.2	na	na	na	96.9	3.3	8.5	na	113.3	60.0
	1984	3.1	3.4	25.3	na	na	na	108.2	5.2	15.5	na	118.8	58.1
Olin	1985	2.3	1.6	34.0	7.2	10.3	118	86.9	8.8	21.5	3.0	109.6	39.3
	1984	4.3	3.1	29.9	7.5	8.4	116	35.9	8.0	19.2	2.6	113.3	41.9
PPG Industries	1985	7.0	5.5	35.4	21.5	23.7	116	36.4	10.4	18.2	4.0	106.4	59.3
	1984	7.1	5.9	17.8	22.3	21.4	113	32.4	7.4	13.9	3.5	111.7	59.2
Pennwalt	1985	1.1	0.9	30.1	19.8	18.3	102	319.6	8.9	20.7	3.9	105.7	53.3
	1984	4.3	3.8	19.0	18.0	11.9	107	67.4	8.3	22.1	3.5	117.9	51.5
Rohm & Haas	1985	6.9	5.8	20.7	32.5	26.6	173	34.8	7.8	27.4	6.0	118.3	38.7
	1984	8.4	7.6	15.1	32.6	26.0	172	26.8	6.6	24.2	5.4	125.0	38.4
Union Carbide	1985	2.3	1.4	30.3	29.2	28.9	98	113.4	7.2	11.2	3.1	85.1	54.2
	1984	3.6	2.4	32.4	28.8	29.0	97	70.4	7.0	10.5	2.8	90.4	57.3
Williams Cos.	1985	1.0	0.7	60.3	na	na	191	152.2	12.0	13.5	na	72.4	72.5
	1984	4.3	2.8	59.3	na	na	183	29.6	7.7	8.1	na	74.7	76.5
Witco	1985	3.9	4.3	24.7	14.0	13.5	na	38.4	4.9	19.7	na	178.8	39.3
	1984	4.2	6.1	27.7	13.6	12.1	na	32.7	4.4	18.8	na	197.9	53.0
MEDIAN 1985		**3.4%**	**3.3%**	**30.3%**	**21.5%**	**18.0%**	**$118**	**76.0%**	**7.1%**	**18.2%**	**3.1%**	**103.9%**	**52.3%**
MEDIAN 1984		**4.8%**	**4.2%**	**27.2%**	**21.0%**	**14.0%**	**$113**	**41.5%**	**6.8%**	**16.5%**	**2.8%**	**113.3%**	**53.0%**

a Net income as a percentage of sales. b Net income as a percentage of current assets plus gross plant. c Consolidated sales only. d Foreign identifiable assets as a percentage of total assets. e Thousands of dollars. f Actual spending on construction of new facilities and purchase of new equipment and land in consolidated businesses. g For fiscal year ended Sept. 30. h For fiscal

		Profit margin[a]	Return on investment[b]	Debt as % debt plus equity	% total sales abroad[c]	% total assets abroad[d]	Sales per employee[e]	Dividends as % of net income	CAPITAL SPENDING[f] as % of sales	CAPITAL SPENDING[f] as % of net plant	R&D as % of sales	Sales as % of assets	Net plant as % of gross plant
SALES LESS THAN $1 BILLION													
Betz Laboratories	1985	11.5%	13.3%	0.0%	13.6%	15.1%	$126	55.2%	8.5%	22.0%	3.8%	125.9%	64.8%
	1984	12.1	15.4	0.2	13.5	13.5	124	49.3	8.3	23.2	3.6	137.7	67.2
Chemed	1985	6.6	12.6	36.8	11.4	10.7	62	61.2	2.4	18.8	1.1	144.8	60.0
	1984	5.8	13.0	47.3	10.5	9.9	67	64.7	2.7	22.7	0.8	165.5	62.5
Crompton & Knowles	1985	3.3	5.1	20.6	17.2	21.9	na	57.9	1.5	11.2	2.0	178.0	50.1
	1984	3.4	5.7	21.0	18.9	19.9	100	53.2	1.7	12.7	1.9	186.0	53.7
Essex Chemical	1985	4.5	5.1	45.0	na	na	204	37.6	4.6	13.7	2.2	134.4	60.5
	1984	5.2	5.6	51.8	na	na	207	31.9	3.9	10.9	2.0	129.3	62.1
First Mississippi[h]	1985	6.7	3.7	32.5	12.6	na	374	26.9	23.2	27.0	na	69.1	57.3
	1984	5.9	3.5	31.8	6.4	na	335	31.0	15.2	19.6	na	70.9	59.9
Freeport-McMoRan	1985	15.4	4.1	41.6	na	na	160	22.6	28.7	12.8	na	35.1	66.9
	1984	11.2	3.7	42.7	na	na	175	45.3	22.6	12.1	na	44.2	66.8
H. B. Fuller[i]	1985	2.9	4.6	28.0	38.1	51.1	104	21.8	3.1	14.8	2.1	180.6	63.9
	1984	2.9	5.0	34.0	37.7	49.8	104	20.8	2.9	14.6	2.1	189.4	65.9
GAF Corp.	1985	7.4	7.4	45.5	12.2	6.0	170	7.6	6.4	24.3	1.4	83.3	63.0
	1984	5.6	7.7	25.3	11.1	10.5	192	10.7	2.4	10.0	1.2	161.7	64.2
Great Lakes	1985	10.4	7.6	15.9	19.5	na	na	24.0	7.7	15.5	3.4	85.7	57.2
	1984	12.6	10.8	16.8	18.0	na	167	0.9	10.2	22.0	3.5	99.6	61.0
International Flavors	1985	13.9	10.4	0.0	62.2	46.2	135	59.8	4.4	13.9	6.8	89.5	56.2
	1984	14.5	12.8	0.0	62.3	46.7	129	57.8	4.4	14.9	6.8	105.4	57.9
Lawter International	1985	def	def	9.2	34.1	33.7	na	def	3.3	14.1	2.2	115.2	53.4
	1984	15.1	16.0	7.6	31.5	29.1	na	64.4	3.4	15.6	1.8	126.3	56.1
Liquid Air	1985	5.8	3.7	35.1	34.9	33.6	123	67.5	19.1	24.8	1.8	85.7	58.8
	1984	5.4	3.5	39.9	33.9	36.9	na	78.4	12.5	16.9	1.9	85.8	58.7
Loctite[h]	1985	8.8	8.7	10.4	42.6	48.4	94	34.8	4.9	22.7	3.8	105.7	60.3
	1984	10.9	11.6	10.7	39.0	45.1	98	20.5	2.6	13.6	3.1	106.3	62.2
Lubrizol	1985	8.7	5.7	12.4	47.7	29.5	174	78.1	4.4	13.6	4.8	105.7	48.3
	1984	8.1	7.6	6.0	52.0	31.6	198	64.7	3.5	11.7	3.9	118.5	48.5
Nalco Chemical	1985	10.7	10.7	5.8	21.7	21.3	135	64.1	8.8	24.2	4.7	126.0	49.7
	1984	11.0	11.6	5.1	21.5	20.9	140	64.4	7.9	25.6	4.8	138.6	48.1
Petrolite[j]	1985	7.2	7.0	3.6	22.0	20.0	na	58.5	7.6	28.4	4.1	135.5	45.9
	1984	8.8	8.3	4.6	18.9	14.9	na	47.3	3.8	15.7	3.8	132.8	43.8
Reichhold Chemicals	1985	def	def	36.9	24.3	32.6	180	def	11.9	48.0	2.7	165.8	66.4
	1984	3.2	5.4	18.8	10.3	11.0	191	23.7	3.0	14.1	2.3	214.4	57.5
Sigma-Aldrich	1985	13.5	13.8	10.2	12.2	12.7	86	18.7	8.1	30.1	na	115.1	67.6
	1984	13.5	12.6	9.3	11.6	8.4	82	18.6	6.6	25.9	na	103.1	66.1
Stepan	1985	2.3	2.6	62.5	na	na	264	36.4	8.1	23.2	3.5	169.3	51.6
	1984	2.3	2.7	41.6	na	na	270	38.9	4.9	15.8	3.4	175.4	51.2
MEDIAN 1985		**6.7%**	**5.7%**	**20.6%**	**21.9%**	**25.7%**	**$135**	**38.4%**	**7.6%**	**22.0%**	**3.1%**	**115.2%**	**58.8%**
MEDIAN 1984		**8.1%**	**7.7%**	**18.8%**	**18.9%**	**20.4%**	**$153**	**45.3%**	**3.9%**	**15.6%**	**2.7%**	**129.3%**	**59.9%**

year ended June 30. [i] For fiscal year ended Nov. 30. [j] For fiscal year ended Oct. 31. Note: Net income is from continuing operations, excluding extraordinary and nonrecurring items where possible. na = not available. def = deficit.

Chemical capital spending is continuing its recovery and increasing relative to sales



a Planned. **Source:** Worldwide data for 13 major U.S. chemical companies

INDUSTRY CAPITAL SPENDING: Budgeted spending falls slightly for chemical industry

$ Billions	1986[a]	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976
Chemicals	$ 17.36	$ 16.45	$ 15.32	$ 12.96	$ 12.66	$ 13.11	$ 11.63	$ 9.81	$ 7.76	$ 7.35	$ 7.37
Iron and steel	4.02	4.10	3.54	3.25	3.78	3.48	3.44	3.21	2.60	2.88	3.13
Nonferrous metals	1.91	1.88	2.13	1.74	1.90	2.51	2.13	1.65	1.46	1.30	1.42
Paper	8.85	8.53	7.21	5.92	5.60	6.11	6.52	5.24	3.80	3.48	2.99
Petroleum	24.53	26.68	25.53	23.14	26.39	25.98	19.57	15.24	13.16	11.82	10.02
Rubber	3.95	3.83	3.11	2.46	2.16	2.15	2.03	2.46	2.33	1.77	1.37
Stone, clay, glass	3.25	3.40	3.09	2.77	2.90	3.41	3.98	3.99	3.15	2.30	1.91
All manufacturing	151.84	153.15	138.82	116.20	120.68	126.54	112.33	95.92	75.58	67.48	58.53

a Estimate. **Source:** Commerce Department

Chemical industry's backlog of unspent funds continues to grow

$ Billions	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975
Chemicals	$ 8.0	$ 7.8	$ 7.5	$ 7.4	$ 9.4	$ 9.8	$ 8.5	$ 7.2	$ 7.4	$77.1	$ 6.9
Iron and steel	1.1	2.1	2.2	2.7	5.4	3.9	4.5	4.0	3.6	4.7	5.4
Nonferrous metals	2.3	2.5	3.2	3.2	3.7	3.7	2.9	2.7	2.9	2.4	2.2
Paper	4.3	5.9	4.0	5.1	5.1	4.0	4.2	3.2	2.6	2.0	2.7
Petroleum	26.2	24.7	22.3	22.9	29.7	26.7	16.1	14.6	15.0	12.2	14.1
Rubber	3.1	1.6	1.1	1.0	0.9	1.0	0.9	0.9	0.8	0.7	0.6
Stone, clay, glass	2.0	2.2	1.5	1.6	1.9	2.0	2.3	2.4	2.0	1.5	1.4
All manufacturing	95.0	94.4	73.7	70.8	92.7	91.9	76.7	63.4	56.5	47.5	46.4

Note: Figures are for fourth quarter of each year. **Source:** Conference Board

Chemical companies' spending overseas will hit a new high this year

$ Billions[a]	1986[b]	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976
Chemicals & allied products	$ 3.2	$ 2.6	$ 2.6	$ 2.3	$ 2.8	$ 3.0	$ 3.0	$ 2.6	$ 1.9	$ 2.0	$ 2.7
Metals, primary & fabricated	0.7	0.9	1.0	0.9	0.9	0.8	0.9	0.6	0.6	0.5	0.7
Petroleum	15.7	14.9	14.1	15.5	19.7	15.8	14.8	11.0	9.5	8.9	7.9
All manufacturing	17.3	15.3	14.0	13.7	16.8	19.2	19.5	15.4	12.0	10.5	10.9

a By majority-owned foreign affiliates of U.S. companies. b Planned. **Source:** Commerce Department

Capital spending in the U.S. chemical industry continued its upward trend in 1985 and will keep rising in 1986. But it is still far below what it was in the early years of this decade.

C&EN's survey of 13 major chemical companies shows that their total capital spending rose 7% in 1985 to $5.81 billion. The increase will be smaller this year—about 3%. Nevertheless, capital spending will top $6 billion for the first time since 1982. Capital spending will climb to about 8.8% of sales in 1986, moreover compared with 8.5% in 1985 and 7.5% in 1984.

The Commerce Department's latest capital spending survey, meanwhile, shows outlays for new plant and equipment in the broader chemicals and allied products industry was up 7% in 1985 to about $16.7 billion. And the government data show expenditures in 1986 climbing 5.5% to about $17.4 billion. This is a major revision from a Commerce Department survey late last year that indicated chemical capital spending would decline almost 1% in 1986.

Although the chemical industry lagged all manufacturing in the government's survey in 1985, it will be pulling ahead in 1986 in terms of growth. The Commerce Department says that capital spending for all manufacturing last year rose 10% to about $153.2 billion, but in 1986, capital spending will fall about 1% to $151.8 billion.

That's a big downward revision and is caused largely by massive changes for capital spending in the petroleum industry. The Commerce Department changed its outlook for petroleum expenditures in 1986 from an increase of 3% to a decline of 8% as the industry is hard-hit by declining oil prices and increasing availability of crude oil worldwide.

A large backlog of unspent capital appropriations also foretokens an increase in spending for 1986. The Conference Board's survey of capital appropriations shows backlogs for the chemicals and allied products industry at the end of 1985 at $8.0 billion up 3% from the end of 1984. The growth in the backlog in 1985 was much larger for chemicals and allied products than for all manufacturing, for which the backlog in 1985 totaled $95.0 billion, up less than 1% from the end of 1984. This is the reverse of the situation at the end of 1984 when the backlog for chemicals was up only 4% from a year earlier but that for all manufacturing climbed 28%.

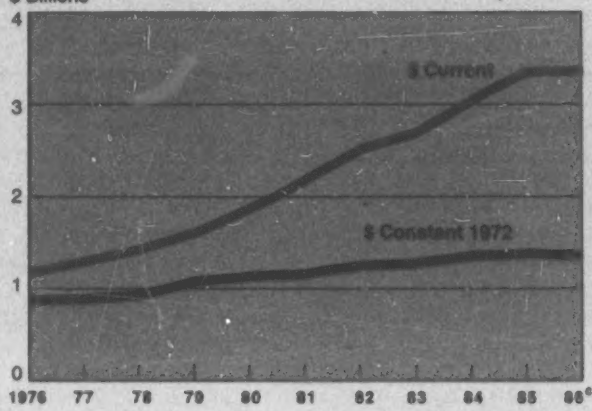
According to Commerce Department surveys, capital spending overseas by U.S. chemical companies also will pick up in 1986, after being unchanged in 1985. The latest government tabulation of overseas spending on new plant and equipment by wholly owned affiliates of U.S. chemical companies shows such expenditures rising 23% in 1986 to $3.2 billion, the highest level ever. For all manufacturing, the increase will be 13% to about $17.3 billion.

CHEMICAL CAPITAL SPENDING: Companies plan moderate increases for 1986

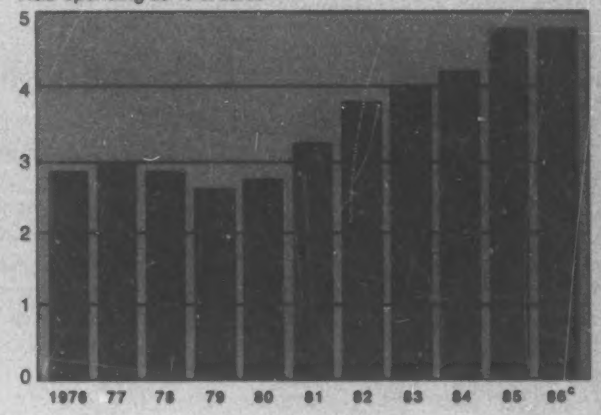
$ Millions	1986[a]	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976
Air Products	$ 402	$ 392	$ 263	$ 246	$ 347	$ 323	$ 364	$ 246	$ 200	$ 143	$ 162
American Cyanamid	200	203	200	165	171	181	196	235	251	235	232
Celanese	200	159	275	105	275	414	253	245	248	243	223
Dow Chemical	900	806	781	630	829	1176	1184	1268	1075	1163	1200
Du Pont[b]	1600	1515	1319	1276	1300	1420	1297	864	714	704	876
Ethyl	135	90	103	85	92	141	156	123	96	88	88
W. R. Grace	390	348	380	353	560	657	658	514	313	279	234
Hercules	215	234	218	168	174	167	229	186	116	127	150
Monsanto	525	645	614	560	673	668	781	566	480	607	647
Olin	110	154	165	123	129	186	172	161	163	208	166
PPG Industries	455	452	315	450	452	376	401	252	261	212	177
Rohm & Haas	200	159	124	72	126	162	93	68	66	79	110
Union Carbide	675	649	670	761	1179	1186	1129	831	688	805	965
TOTAL	$6007	$5606	$5427	$4994	$6307	$7077	$6913	$5559	4671	4893	5230
ANNUAL CHANGE	3%	7%	9%	−21%	−11%	2%	24%	19%	−5%	−6%	8%

a Planned. b Excludes Conoco. **Note:** Figures are for worldwide spending on construction, equipment, and land in consolidated businesses. Where possible, acquisition costs and investments in nonconsolidated businesses are excluded. **Source:** Company data

Chemical companies' R&D budgets will be flat this year . . .



. . . but spending will remain high relative to sales



a R&D spending by 14 basic chemical companies. b For 14 basic chemical companies. c Estimated.
Sources: Worldwide data for 14 U.S. basic chemical companies, Battelle Columbus Laboratories, C&EN estimates

With no solid prospect of an increase in sales this year, the U.S. chemical industry is holding the line on its spending for research and development, according to C&EN's survey of 13 basic chemical companies. Spending will be flat in 1986, ending two years of double-digit increases. Adjusted for anticipated inflation in R&D costs, spending actually will decline 4% from 1985.

This cautious budgeting does not signal a reversal of the industry's six-year-old renewal of emphasis on research. Companies will still be spending about 4.8% of sales on R&D this year, the same as in 1985 and far higher than the recent nadir of 2.7% reached in 1979. The industry is still firmly pledged to develop new, higher-value products. Last year's widespread retrenchments and the recognition that prices of commodity chemicals—the cash cows that fund R&D—are not likely to rise much anytime soon cannot be ignored, however, and so spending plans have been adjusted.

The outlook for 1986 R&D spending is also somewhat skewed by the large drop likely in Union Carbide's research budget. Much of the decrease is due to the company's divestiture this year of several large units. Even if 1985 spending is restated to exclude those units, however, Carbide's R&D budget for 1986 still is down 8%. On that basis, spending by the 13 companies still would be up only 2% on a current-dollar basis and would fall 2% after being adjusted for inflation.

CHEMICAL R&D SPENDING: Essentially no growth in 1986

$ Millions	1986[a]	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976
Air Products	$ 60	$ 51	$ 44	$ 40	$ 37	$ 32	$ 30	$ 24	$ 23	$ 24	$ 19
American Cyanamid	265	251	232	208	185	166	148	130	108	96	83
Celanese	105	103	94	85	100	104	94	92	83	77	70
Dow Chemical	600	547	507	492	460	404	314	269	232	203	188
Du Pont[b]	1030	1080	1000	875	775	647	591	509	461	367	353
Ethyl	47	47	40	39	39	37	34	29	25	28	25
W. R. Grace	100	92	81	73	64	57	45	42	37	32	28
Hercules	69	76	72	74	74	65	57	50	43	40	37
Monsanto	520	470	370	290	264	233	208	161	136	132	114
Olin	59	53	52	49	45	38	31	26	25	25	23
PPG Industries[c]	176	176	150	127	127	119	103	83	70	61	56
Rohm & Haas	125	124	109	100	92	77	67	54	49	45	43
Union Carbide[d]	191	275	265	245	240	207	166	161	156	156	143
TOTAL	$3347	$3345	$3016	$2697	$2502	$2186	$1838	$1630	$1448	$1286	$1182
ANNUAL CHANGE	0%	11%	12%	8%	14%	19%	13%	13%	13%	9%	9%

a Planned. b Excludes petroleum and coal segments. c Historical figures net of taxes and depreciation; 1986 estimated. d Company is divesting a substantial share of assets this year; restated on a continuing operations basis. 1985 R&D spending total was $207 million. Sources: Company data and estimates

INDUSTRY BALANCE SHEET: Liabilities rise considerably and stockholders' equity slips

Industrial chemicals and synthetics

Assets	1985 ($ billions)	1984 ($ billions)	Change
Current assets:			
Cash and U.S. bank deposits	$ 2.30	$ 1.10	109%
Short-term securities	1.13	1.29	−12
Receivables	13.65	13.07	4
Inventories	12.25	12.24	0
Other current assets	3.07	2.89	6
Total	**32.41**	**30.60**	**6**
Fixed assets			
Depreciable fixed assets	84.14	81.80	3
Land and mineral rights	3.60	3.44	5
Less: accumulated depreciation and depletion	43.97	41.34	6
Net fixed assets	**43.77**	**43.90**	**0**
Other assets, including investments and intangibles	**24.68**	**19.10**	**29**
TOTAL ASSETS	**$100.86**	**$93.61**	**8%**

Liabilities and stockholders' equity	1985 ($ billions)	1984 ($ billions)	Change
Current liabilities:			
Short-term debt	$ 3.98	$ 1.89	111%
Accounts payable	7.00	6.73	4
Accrued income taxes	1.11	1.44	−23
Current portion of long-term debt	1.14	1.26	−10
Other current liabilities	11.48	9.69	18
Total	**24.71**	**21.01**	**18**
Long-term debt	**22.38**	**18.12**	**24**
Other noncurrent liabilities, including deferred taxes and minority interest	**9.64**	**7.96**	**21**
TOTAL LIABILITIES	**56.73**	**47.09**	**20**
Stockholders' equity			
Capital stock and other capital	16.54	16.87	−2
Retained earnings	27.59	29.65	−7
TOTAL STOCKHOLDERS' EQUITY	**44.13**	**46.53**	**−5**
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	**$100.86**	**$93.61**	**8%**

Source: Bureau of the Census

DEBT RATIOS: Up markedly last year from the low level of the previous year

$ Billions	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975
INDUSTRIAL CHEMICALS AND SYNTHETICS											
Long-term debt	$22.4	$18.1	$19.4	$22.0	$21.4	$16.8	$14.8	$13.6	$12.3	$11.8	$10.2
Stockholders' equity	$44.1	$46.5	$45.3	$45.9	$42.5	$39.8	$32.3	$29.3	$26.3	$25.0	$22.8
Debt ratio[a]	33.6%	28.0%	30.0%	32.4%	33.5%	29.6%	31.4%	31.8%	31.9%	32.0%	30.8%
CHEMICALS AND ALLIED PRODUCTS											
Long-term debt	$39.5	$33.8	$36.2	$38.2	$36.9	$28.3	$24.9	$23.5	$21.1	$19.4	$16.8
Stockholders' equity	$100.0	$100.3	$97.2	$95.3	$89.9	$79.5	$67.4	$60.8	$54.9	$50.8	$45.7
Debt ratio[a]	28.3%	25.2%	27.2%	28.6%	29.1%	26.3%	27.0%	27.9%	27.8%	27.6%	26.9%
ALL MANUFACTURING											
Long-term debt	$362.7	$324.2	$286.6	$293.1	$266.5	$236.2	$204.8	$182.0	$167.3	$153.6	$145.2
Stockholders' equity	$875.0	$883.6	$837.6	$783.0	$762.3	$699.7	$624.0	$560.8	$511.7	$475.3	$435.5
Debt ratio[a]	29.3%	26.8%	25.5%	27.2%	25.9%	25.2%	24.7%	24.5%	24.6%	24.4%	25.0%

a Long-term debt as a percentage of long-term debt plus stockholders' equity. **Note:** Because of changes in accounting rules and industry classifications, numbers over the entire range of years are not strictly comparable. **Source:** Bureau of the Census

CASH FLOW: A year of corporate restructuring changes the typical pattern

$ Millions, % of total	1985		1984		1983		1982		1981	
SOURCES OF FUNDS										
Net income	$ 991	6.3%	$ 3,917	29.5%	$ 2,735	21.5%	$ 2,347	19.4%	$ 3,629	17.1%
Depreciation and depletion	5,029	31.9	4,699	35.4	4,633	36.4	4,346	36.0	3,633	17.1
Deferred taxes	20	0.1	591	4.4	362	2.8	570	4.7	906	4.3
Other internal sources	7,271	46.1	2,496	18.8	2,591	20.4	1,841	15.2	1,308	6.1
Long-term debt	2,310	14.7	1,451	10.9	1,899	14.9	2,554	21.1	7,190	33.9
Stock	140	0.9	135	1.0	514	4.0	427	3.5	4,567	21.5
TOTAL	**$15,761**	**100.0%**	**$13,288**	**100.0%**	**$12,734**	**100.0%**	**$12,085**	**100.0%**	**$21,233**	**100.0%**
APPLICATIONS OF FUNDS										
Dividends	$ 1,940	12.3%	$ 1,891	14.2%	$ 1,754	13.8%	$ 1,682	13.9%	$ 1,569	7.4%
Capital expenditures	6,493	41.2	6,335	47.7	5,619	44.1	7,192	59.5	6,975	32.9
Additions to working capital	150	1.0	−16	−0.1	−343	−2.7	−1,548	−12.8	3,576	16.8
Reduction of long-term debt	2,829	17.9	2,649	19.9	3,380	26.6	3,398	28.1	1,081	5.1
Other applications	4,348	27.6	2,429	18.3	2,324	18.2	1,361	11.3	8,032	37.8
TOTAL	**$15,761**	**100.0%**	**$13,288**	**100.0%**	**$12,734**	**100.0%**	**$12,085**	**100.0%**	**$21,233**	**100.0%**

Note: Data are totals for 12 major chemical companies: American Cyanamid, Celanese, Dow Chemical, Du Pont, Ethyl, Hercules, Monsanto, Olin, Pennwalt, Rohm & Haas, Union Carbide, and Williams Cos. **Sources:** Company annual reports

Last year was, at best, a standoff for the major U.S. producers of chemicals. Sales were lower for nearly as many companies as reported increased revenues. And earnings fell for almost twice as many companies as reported improved net income. Profitability, in fact, was especially hard hit in 1985. Among the 35 leading chemical companies for whom annual financial data are reported on this page and the three that follow, only about one in six reported a higher profit margin last year, and a mere one in seven chalked up an improvement in return on stockholders' equity.

For many companies, however, last year's financial results were severely affected by a host of unusual charges. The restructuring that many firms have undertaken in recent years in their attempt to streamline their operations, shuck off unpromising product lines, reduce staffs, and generally improve operating efficiency is especially evident in the asset write-downs, accounting changes, and other special charges taken against 1985 revenues. Dow Chemical, for one, wrote off a pretax $471 million in assets in its effort to cut back excess capacity, which was largely responsible for the 90% drop in its net income. Restructuring programs similarly cost Monsanto $341 million, after taxes, and Olin $230 million, pulling both companies into the red for the year. Likewise, Union Carbide's complex steps to restructure itself while fending off a hostile takeover attempt by GAF Corp., which included the sale of its consumer products businesses, drastically changed the company from what it had been a year earlier.

Explanation of table headings

Year. Data are for calendar year unless otherwise indicated.

Net sales. Gross sales, less discounts, allowances, and returns; generally excludes excise taxes and other operating income or revenues.

Net income. Net sales and other income, less operating costs, nonoperating charges, depreciation, depletion, interest expense, deferred charges, minority interest in income, and taxes. Nonrecurring or extraordinary credits and charges have been excluded in most cases, but these items are indicated by a footnote.

Total assets. Sum at year's end of current assets, investments, prepaid expenses, net plant and equipment, and other tangible assets. Excludes insofar as possible intangible assets including goodwill, value of patents and trademarks, and the like.

Current ratio. The ratio of current assets (cash, marketable securities, receivables, and inventories but excluding prepaid expenses) to total current liabilities.

Net plant and equipment. Value at year's end of fixed assets, less accumulated depreciation, amortization, and depletion.

Capital expenditures. Total spending during the year for new fixed assets, such as plant, equipment, and land, and for replacement and modernization of facilities.

Net worth. Equity at year's end of preferred and common stock holders, including value of capital stock, capital and earned surplus, and surplus reserves, as well as contingency and miscellaneous reserves for which no definite purpose is stated. Intangible assets are deducted insofar as possible.

Net income (breakdown). **Per cent of sales:** net income divided by net sales. **Per cent of net worth:** net income divided by tangible net worth. **Dollars per share:** net income, less preferred dividends, divided by the number of shares of common stock outstanding. All figures are adjusted for stock splits, but no adjustment has been made for earlier years as a result of stock dividends or for dilution that might result from the conversion of preferred stock or debt to common stock or the exercise of stock options outstanding.

Dividends per share. Cash dividends paid (or declared) on each share of common stock; excludes the value of stock dividends, which are indicated by a footnote.

Dividend yield. Dividends per share divided by the average of the high and low prices of the common stock during the calendar year.

Stock price range. High-low market prices of common stock during the calendar year, adjusted for stock splits but not for stock dividends.

Price-earnings ratio. Average of the high and low prices of the common stock during the calendar year divided by net income per share.

Year	Net sales	Net income	Total assets	Current ratio	Net plant and equipment	Capital expenditures	Net worth	NET INCOME: % of sales	NET INCOME: % of net worth	NET INCOME: $ per share	Dividends, $ per share	Dividend yield, % of price	Stock price range, $ per share	Price-earnings ratio
Money figures in thousands of dollars unless otherwise indicated														
CHEMICALS														
Air Products & Chemicals														
1985[a]	$1,829,588	$143,484	$2,539,545	1.1	$1,782,267	$392,176	$1,109,068	7.8%	12.9%	$2.38	$0.635	2.3%	$88⅛–44½	11.9
1984[a]	1,735,115	140,618	2,267,457	1.1	1,587,382	262,491	1,058,328	8.1	13.3	2.28	0.525	2.5	24⅛–18¾	9.3
1983[a]	1,634,246	108,963	2,160,157	1.1	1,541,345	246,417	988,256	6.7	11.0	1.78	0.45	2.1	25½–17	12.0
1982[a]	1,568,916	105,654[b]	2,118,882	1.2	1,497,162	346,580	867,565	6.7	12.2	1.84[b]	0.40	2.5	20½–11⅛	8.8
American Cyanamid Co.														
1985	$3,533,100	$120,200[c]	$3,383,400	2.0	$1,126,900	$202,600	$1,623,000	3.4%	7.4%	$2.50[c]	$1.90	3.5%	$59⅛–49	21.4
1984	3,856,726	215,918	3,304,027	1.9	1,241,927	200,110	1,645,122	5.6	13.1	4.41	1.86	3.9	53⅛–42⅛	10.8
1983	3,535,514	166,356	3,031,311	2.1	1,255,658	165,068	1,578,875	4.7	10.5	3.41	1.75	3.8	59–33⅝	13.6
1982	3,453,674	132,127	2,985,004	2.0	1,296,204	171,047	1,526,390	3.8	8.7	2.74	1.75	5.7	37½–24⅝	11.3
Betz Laboratories														
1985	$319,381	$36,792	$253,704	2.2	$137,255	$27,030	$194,703	11.5%	18.9%	$2.33	$1.26	3.7%	$38⅛–30⅛	14.7
1984	303,883	36,737	220,662	2.1	123,296	25,302	170,684	12.1	21.5	2.33	1.10	3.3	39–27⅛	14.2
1983	266,983	33,100	204,174	2.1	110,872	32,795	161,766	12.4	20.5	2.08	0.94	2.4	44⅜–32⅛	18.5
1982	254,717	30,561	186,320	2.0	87,382	24,769	143,421	12.0	21.3	1.93	0.82	2.4	42⅛–24⅝	17.4
Big Three Industries														
1985	$834,170	$14,537[d]	$1,066,832	2.4	$756,564	$76,044	$511,546	1.7%	2.8%	$0.38[d]	$0.82	3.5%	$26⅝–19⅛	61.2
1984	775,678	56,696	1,152,791	2.1	820,807	96,897	566,272	7.3	10.0	1.40	0.80	3.7	24⅞–18¼	15.4
1983	868,841	45,331	1,097,602	3.0	763,863	71,581	615,720	5.8	7.4	1.07	0.74	3.2	27⅝–18½	21.6
1982	767,785	86,812	1,055,313	3.0	773,777	162,293	609,792	11.3	14.2	2.05	0.72	3.3	28½–16⅛	10.8

a Fiscal year ends Sept. 30. b Excludes extraordinary gain for debt-to-equity exchange of $2.8 million ($0.05 per share) and credit for cumulative effect of change in accounting principle for investment tax credit of $61.9 million ($2.16 per share). c From continuing operations; excludes net income and gain on sale of Formica Brand Products Group of $8.9 million ($0.18 per share). d Includes special charge for inventory and equipment write-down of $42.3 million ($1.10 per share).

Year	Net sales	Net income	Total assets	Current ratio	Net plant and equipment	Capital expenditures	Net worth	NET INCOME % of sales	NET INCOME % of net worth	NET INCOME $ per share	Dividends, $ per share	Dividend yield, % of price	Stock price range, $ per share	Price-earnings ratio
					Money figures in thousands of dollars unless otherwise indicated									
Cabot Corp.														
1985[a]	$1,407,516	$71,290[b]	$1,573,065	1.9	$ 623,211	$141,558	$604,085	5.1%	11.8%	$2.22[b]	$0.92	3.4%	$33¾–20½	12.2
1984[a]	1,752,523	97,073	1,730,722	1.8	1,051,251	116,911	699,167	5.5	13.9	3.02	0.92	3.6	28⅞–22⅜	8.5
1983[a]	1,558,016	64,162	1,293,340	2.6	656,894	76,964	658,838	4.1	9.7	2.00	0.92	3.8	30⅞–20½	12.8
1982[a]	1,587,658	88,007	1,300,553	2.2	664,434	138,342	624,089	5.5	14.1	2.77	0.92	4.4	25½–16⅛	7.5
Celanese Corp.														
1985	$3,048,000	$178,000	$2,809,000	1.3	$1,217,000	$159,000	$1,017,000	5.8%	17.5%	$13.70	$4.50	3.9%	$151–79⅝	8.4
1984	3,328,000	161,000	3,104,000	1.6	1,349,000	169,000	1,099,000	4.8	14.6	10.87	4.10	5.7	82–62⅝	6.7
1983	3,291,000	112,000	2,869,000	1.7	1,445,000	105,000	1,169,000	3.4	9.6	6.89	4.00	6.4	79⅝–45	9.1
1982	3,062,000	(34,000)[c]	2,862,000	1.9	1,608,000	275,000	1,131,000	—	—	(2.45)[c]	4.00	7.9	59⅞–41½	—
Chemed Corp.														
1985	$372,677	$21,858	$197,615	1.7	$42,092	$7,874	$58,234	5.9%	37.5%	$2.49	$1.52	5.1%	$33⅜–25⅜	11.9
1984	346,140	20,110	180,518	1.7	45,517	9,198	49,822	5.8	40.4	2.29	1.48	4.7	36⅝–25⅜	13.8
1983	271,343	17,371[d]	174,248	1.9	35,012	5,703	58,420	6.4	29.7	2.17[d]	1.36	3.8	39⅝–32	16.4
1982	249,019	16,824[e]	152,735	1.7	30,887	5,008	36,448	6.8	46.2	1.79[e]	1.25	4.7	36–17⅜	14.9
Crompton & Knowles Corp.														
1985	$231,225	$7,575	$120,076	2.5	$30,376	$3,362	$63,639	3.3%	11.9%	$2.20	$1.20	5.3%	$27½–18⅝	10.3
1984	230,434	7,891	114,135	2.5	30,809	3,917	59,586	3.4	13.2	2.31	1.14	5.3	23⅝–19¼	9.3
1983	230,560	6,302	115,536	2.6	31,205	2,954	57,893	2.7	10.9	1.81	1.06	4.6	28¼–16⅝	12.6
1982	213,250	5,199	117,902	2.6	33,055	3,582	56,320	2.4	8.8	1.44	1.04	6.6	19⅝–12⅛	9.1
Dow Chemical Co.														
1985	$11,537,000	$ 58,000	$11,565,000	1.5	$5,127,000	$806,000	$4,527,000	0.5%	1.3%	$0.31	$1.80	5.2%	$41⅞–27	111.1
1984	11,418,000	549,000[f]	11,217,000	1.5	5,173,000	781,000	4,860,000	4.8	11.3	2.83	1.80	6.0	34½–25⅝	10.6
1983	10,951,000	293,000[g]	11,785,000	1.4	5,695,000	630,000	4,851,000	2.7	6.0	1.50[g]	1.80	5.7	38⅝–25	21.1
1982	10,618,000	342,000[h]	11,612,000	1.8	5,961,000	829,000	4,845,000	3.2	7.1	1.77[h]	1.80	7.4	28⅞–19⅝	13.7
E. I. du Pont de Nemours & Co.														
1985	$29,483,000	$1,118,000	$25,140,000	1.6	$15,195,000	$3,046,000	$12,659,000	3.8%	8.8%	$4.61	$3.00	5.1%	$89⅜–47⅝	12.7
1984	35,915,000	1,431,000	24,098,000	1.6	14,409,000	2,931,000	12,233,000	4.0	11.7	5.93	2.90	6.1	52⅛–42⅝	8.0
1983	35,378,000	1,127,000	24,432,000	1.7	14,261,000	2,628,000	11,472,000	3.2	9.8	4.70	2.50	5.5	55–35½	9.8
1982	33,331,000	894,000	24,343,000	1.7	14,004,000	3,295,000	10,850,000	2.7	8.2	3.75	2.40	6.5	44⅜–30	9.9
Ethyl Corp.														
1985	$1,547,034	$117,146	$1,509,988	2.0	$557,256	$ 99,512	$754,853	7.6%	15.5%	$0.92	$0.285	2.5%	$15½–7⅛	12.6
1984	1,675,058	132,184	1,437,207	2.2	573,156	103,416	707,716	7.9	18.7	0.86	0.21	3.2	8⅛–5	7.7
1983	1,745,193	106,038	1,449,982	2.0	626,461	84,723	611,260	6.1	13.1	0.65	0.21	3.9	7¼–3⅝	8.4
1982	1,614,626	94,166	1,458,534	2.2	668,186	91,915	766,175	5.8	12.3	0.59	0.19	5.7	4⅛–2⅛	5.6
Ferro Corp.														
1985	$651,071	$11,163[i]	$391,133	2.0	$145,651	$27,050	$193,850	1.7%	5.6%	$1.66	$1.20	3.9%	$ 37–24¼	18.4
1984	662,867	16,886	359,938	2.0	135,462	29,364	185,983	2.5	9.1	2.53	1.20	4.0	38½–22¼	12.0
1983	619,179	19,228	364,861	1.9	132,509	20,252	185,337	3.1	10.4	3.04	1.20	3.7	39⅞–24⅝	10.6
1982	595,830	10,227[j]	345,922	2.0	133,318	22,650	161,945	1.7	6.3	1.37[j]	1.20	4.9	30½–18½	17.9
First Mississippi Corp.														
1985[k]	$273,185	$18,239[l]	$395,435	1.5	$234,574	$63,257	$180,787	6.7%	10.1%	$0.90[l]	$0.24	2.5%	$11⅝–6⅝	10.1
1984[k]	270,004	15,845[m]	380,855	1.5	209,742	41,034	166,957	5.9	9.5	0.77[m]	0.24	2.3	13¾–7¼	13.6
1983[k]	283,976	14,146	379,436	1.3	200,990	47,428	155,055	5.0	9.1	0.69	0.24	2.0	15½–8⅛	17.2
1982[k]	222,977	23,212[n]	394,587	1.0	183,904	67,882	145,407	10.4	16.0	1.11[n]	0.24	2.2	16–6	9.9
GAF Corp.														
1985	$731,962	$54,290[o]	$879,174	1.7	$194,098	$47,161	$298,153	7.4%	18.2%	$1.57[o]	$0.10	0.4%	$ 35–12⅛	15.0
1984	731,314	41,409[p]	452,273	2.2	159,115	17,900	214,005	5.7	19.3	1.31[p]	0.05	0.5	12⅞–7½	7.8
1983	699,397	24,189[q,r]	414,267	1.7	164,468	13,904	169,804	—	—	(1.11)[q,r]	0.025	0.3	9⅛–6½	—
1982	623,236	12,182[s]	468,332	1.6	192,400	17,713	181,900	2.0	6.7	0.32[s]	0.25	4.2	7⅝–4⅜	18.7
W. R. Grace & Co.														
1985	$5,193,000	$127,800[t]	$5,287,800	1.9	$2,596,000	$348,000	$2,271,400	2.5%	5.9%	$2.45[t]	$2.80	6.9%	$40½–35½	17.3
1984	6,727,800	195,600	5,193,900	1.6	2,704,200	380,100	2,063,300	2.9	9.5	4.02	2.80	6.7	48⅞–36½	10.4
1983	6,219,500	159,700[u]	4,946,600	1.6	2,715,400	353,100	2,094,300	2.6	7.6	3.28[u]	2.80	8.3	39⅝–30⅝	13.5
1982	6,127,800	319,500[v]	4,854,300	1.7	2,708,400	569,500	2,136,900	5.2	15.0	6.62[v]	2.70	7.2	46½–29½	5.6

a Fiscal year ends Sept. 30. b From continuing operations; excludes net loss from discontinued operations of $12.7 million ($0.39 per share) and provision for net loss on disposal of discontinued operations of $145.0 million ($4.53 per share). c Net loss; includes special charge related to 40% equity in Mexican affiliate of $39 million ($2.50 per share). d Excludes net gain on disposition of discontinued Dearborn Group operations of $875,000 ($0.11 per share). e Excludes net income from discontinued Dearborn Group operations of $1.9 million ($0.11 per share). f Includes pretax gain on sales of investments of $183 million but excludes tax benefit from realization of foreign tax loss carry-forwards of $36 million ($0.19 per share). g Includes pretax gain on sales of investments of $101 million but excludes extraordinary net gain on debt-for-equity exchange of $41 million ($0.21 per share). h Includes pretax gain on sales of investments of $214 million but excludes extraordinary net gain on debt-for-equity exchange of $57 million ($0.20 per share). i Excludes net loss on sale of Productol Chemical Division, of $2.3 million ($0.34 per share). j Includes net loss on divestitures of $1.9 million ($0.23 per share). k Fiscal year ends June 30. l Excludes net gain from disposal of FirstMiss subsidiary of $900,000 ($0.04 per share). m Excludes net gain from disposal of FirstMiss subsidiary of $120,000 ($0.01 per share). n From continuing operations; excludes net loss from discontinued FirstMiss subsidiary of $6.4 million ($0.30 per share). o Excludes extraordinary credits of $23.3 million ($0.68 per share). p Excludes extraordinary credits of $15.7 million ($0.54 per share). q Excludes extraordinary credits of $25.4 million ($0.88 per share). r Deficit. s Excludes extraordinary credits of $38.7 million ($1.35 per share) and income from discontinued operations of $5.3 million ($0.19 per share). t From continuing operations; excludes net income from discontinued retail operations of $19.1 million ($0.37 per share). u Includes net gains on disposal of businesses of $5.7 million. v Includes gain on restructuring Chemed Corp. of $85.1 million and net losses on disposal of businesses of $800,000.

Year	Net sales	Net income	Total assets	Current ratio	Net plant and equipment	Capital expenditures	Net worth	NET INCOME % of sales	NET INCOME % of net worth	NET INCOME $ per share	Dividends, $ per share	Dividend yield, % of price	Stock price range, $ per share	Price-earnings ratio
					Money figures in thousands of dollars unless otherwise indicated									
Great Lakes Chemical Corp.														
1985	$276,932	$28,818	$314,423	2.2	$137,710	$21,344	$186,718	10.4%	15.4%	$1.93	$0.44	1.2%	$44½–31⅛	19.6
1984	278,235	35,568	276,468	2.2	130,784	28,770	164,805	12.8	21.6	2.38	0.36	1.1	39⅝–24	13.2
1983	225,950	23,842	217,916	2.1	121,411	23,383	132,286	10.6	18.0	1.63	0.30	1.1	39⅝–16⅝	17.3
1982	169,703	13,945	192,127	2.2	113,650	19,143	111,782	8.2	12.5	0.96[e]	0.26	1.6	20⅛–12½	16.9
Hercules														
1985	$2,587,213	$133,161	$2,658,822	2.5	$1,000,212	$234,240	$1,474,201	5.1%	9.0%	$2.40	$1.66	4.5%	$40⅝–31⅛	15.0
1984	2,570,965	197,185	2,388,489	2.4	906,031	218,105	1,366,911	7.7	14.4	3.54	1.48	4.5	38–27⅛	9.2
1983	2,626,954	174,222	2,176,173	2.1	793,313	167,993	1,288,118	6.6	13.5	3.17	1.38	3.9	43⅞–27⅛	11.1
1982	2,468,971	86,861[f]	2,001,354	2.2	823,676	184,937	1,078,911	3.5	8.1	1.97[f]	1.32	5.8	29⅝–19⅛	11.6
International Flavors & Fragrances														
1985	$501,046	$69,698	$559,855	4.2	$159,298	$22,134	$426,986	13.9%	16.3%	$1.89	$1.12	3.4%	$ 40–28	17.5
1984	476,678	69,242	452,392	4.4	140,109	20,942	351,183	14.5	19.7	1.89	1.08	4.1	29½–22⅞	13.8
1983	460,945	68,410	458,262	3.5	139,921	26,851	344,255	14.8	19.9	1.87	1.04	3.5	35⅝–23⅝	15.9
1982	447,889	63,160	431,589	4.1	135,565	28,369	335,982	14.1	18.8	1.73	1.01	4.3	30–17⅝	13.7
International Minerals & Chemical Corp.														
1985[b]	$1,627,300	$119,600	$1,957,200	2.0	$2,144,300	$116,000	$1,092,000	7.3%	11.0%	$4.39	$2.60	$6.5%	$ 44–34½	8.9
1984[b]	1,532,900	112,000[g]	1,965,600	1.9	2,061,400	104,800	1,039,100	7.3	10.8	4.17[g]	2.60	6.4	40–32⅞	9.8
1983[b]	1,462,000	80,500	1,943,900	1.9	1,983,700	119,300	1,024,100	5.5	7.9	3.02	2.60	6.5	40–31⅝	13.3
1982[b]	1,560,400	122,300[d]	1,941,900	1.8	1,859,900	161,600	1,010,200	7.8	12.1	4.58[d]	2.60	8.6	30⅞–23½	6.6
Lawter International														
1985	$96,769	($5,413)[a,j]	$84,030	3.4	$22,702	$3,179	$47,588	—	—	($0.31)[a,j]	$0.56	4.7%	$13½–10⅜	—
1984	98,404	14,862	77,877	4.8	21,146	3,339	58,370	15.1%	25.5%	0.86	0.55	4.4	14½–10½	14.5
1983	90,020	14,340	75,615	4.4	21,066	3,345	55,785	15.9	25.7	0.83	0.49	4.6	14⅝–7⅛	12.8
1982	80,029	10,021	63,967	5.1	20,587	4,293	52,387	12.5	19.1	0.58	0.48	6.0	8⅛–5⅝	12.0
Liquid Air Corp.														
1985	$543,041	$31,753	$599,281	1.2	$418,165	$103,675	$289,819	5.8%	11.0%	$2.42	$1.60	6.9%	$27⅝–19½	9.8
1984	501,735	27,304	549,821	1.8	370,530	62,461	246,567	5.4	11.1	2.07	1.56	7.7	23–18⅛	10.0
1983	459,409	23,902	500,573	1.5	354,796	41,620	244,849	5.2	9.8	1.80	1.50	7.2	28⅛–18⅛	12.4
1982	448,996	27,512	503,090	1.8	353,376	58,657	247,801	6.1	11.1	2.13	1.50	9.1	29⅝–14⅝	8.3
Loctite Corp.														
1985[b]	$231,479	$20,443	$215,482	1.9	$49,793	$11,278	$121,918	8.8%	16.8%	$2.24	$0.80	2.5%	$ 37–27	14.3
1984[b]	241,744	26,349	223,694	2.0	45,696	6,172	129,526	10.9	20.3	2.67	0.64	1.7	42⅝–30⅝	13.7
1983[b]	215,892	17,128	209,387	2.2	46,789	9,955	129,419	7.9	13.2	1.72	0.56	1.5	46⅛–28½	21.8
1982[b]	216,450	15,778	196,069	2.4	44,083	10,824	119,752	7.3	13.2	1.59	0.56	2.3	30⅝–18⅛	15.4
Lubrizol Corp.														
1985	$903,403	$60,224	$854,445	2.4	$290,268	$39,498	$519,298	6.7%	11.6%	$1.49	$1.16	4.8%	$28⅞–19⅝	16.3
1984	831,681	67,731	701,974	2.8	251,735	29,490	474,343	8.1	14.3	1.73	1.12	5.2	24⅞–18⅛	12.4
1983	789,546	64,744[g]	682,864	2.8	274,337	25,003	471,521	8.2	13.7	1.65[g]	1.08	4.7	27⅞–18⅛	13.9
1982	801,284	47,561	643,744	2.6	288,504	51,589	462,044	5.9	10.3	1.21	1.08	5.7	23⅝–14⅛	15.7
Monsanto Co.														
1985	$6,747,000	($128,000)[a,k]	$6,678,000	1.1	$3,034,000	$845,000	$1,208,000	—	—	($1.67)[a,k]	$2.45	5.1%	$55⅝–46⅝	—
1984	6,691,000	439,000	6,250,000	2.0	3,374,000	614,000	3,511,000	6.6%	12.5%	5.42	2.25	4.8	53⅞–46⅝	11.5
1983	6,299,000	369,000[l]	6,427,000	2.1	3,284,000	560,000	3,667,000	5.9	10.1	4.48[l]	2.075	4.4	58½–37⅛	10.6
1982	6,325,000	329,000[l]	6,977,000	2.4	3,313,000	673,000	3,490,000	5.2	9.4	4.10[l]	1.975	5.4	44½–28¼	8.9
Morton Thiokol														
1985[b]	$1,832,300	$119,500[h]	$1,173,900	1.8	$560,700	$117,000	$510,500	6.5%	23.4%	$2.44[h]	$0.63	1.9%	$40½–26	13.8
1984[b]	2,001,508	109,750	1,152,082	1.5	526,713	90,859	489,545	5.5	22.4	2.17	0.57	2.2	31½–20	11.9
1983[b]	1,598,157	78,462	1,002,848	1.3	522,938	70,944	401,952	5.2	19.5	1.72	0.53	2.4	29⅞–16½	12.6
1982[b]	786,976	48,499[i]	734,801	2.1	206,813	37,804	371,753	6.2	13.0	1.20	0.51	3.7	18⅝–9¼	11.8
Nalco Chemical Co.														
1985	$582,332	$73,332	$492,908	1.8	$247,912	$59,905	$335,685	10.7%	21.9%	$1.87	$1.20	4.8%	$29⅝–22	13.5
1984	664,303	73,089[m]	471,543	2.4	205,103	52,478	344,392	11.0	21.2	1.80[m]	1.20	4.4	33½–21	14.6
1983	659,403	71,000	487,010	2.3	191,791	40,505	348,386	10.8	20.4	1.78	1.14	3.5	37–28	18.3
1982	643,863	64,356[n]	464,868	2.2	194,450	56,241	336,488	10.0	19.1	1.62[n]	1.12	4.3	34–18	16.0
Olin Corp.														
1985	$1,751,106	($190,308)[a,o]	$1,516,006	1.6	$718,371	$154,498	$804,844	—	—	($3.28)[a,o]	$1.50	4.9%	$ 39–28⅜	—
1984	2,065,328	88,747	1,822,099	1.9	660,658	186,000	987,307	4.3%	10.2%	3.81	1.365	4.7	32½–25¼	7.7
1983	1,934,579	71,715	1,829,416	1.9	650,936	122,580	948,355	3.7	8.5	3.01	1.23	4.3	34–23	9.5
1982	1,823,137	62,800[p]	1,636,027	1.7	639,974	139,015	905,185	3.4	7.8	2.69[p]	1.20	5.7	28⅛–15½	7.8

a Excludes extraordinary net gain on debt-for-equity exchange of $11.6 million ($0.25 per share). b Fiscal year ends June 30. c Excludes net loss from operations and disposal of discontinued methanol joint venture of $30.3 million ($1.13 per share). d From continuing operations; excludes earnings and net gain on disposal of discontinued chemical operations of $15.1 million ($0.57 per share). e Deficit. f Includes one-time tax provision for future repatriation of foreign earnings of $14.0 million ($0.80 per share). g Includes net gain on sale of investments of $7.5 million ($0.19 per share). h Includes special charge for restructuring costs, before taxes, of $557 million but excludes net gain from repayment of debt of $30 million ($0.40 per share). i Excludes extraordinary net tax benefits from utilization of ex-U.S. loss carry-forwards of $33 million ($0.41 per share). j Excludes extraordinary net gain on debt-for-equity exchange of $23 million ($0.29 per share). k From continuing operations; excludes net income from discontinued Texsize division operations of $3.3 million ($0.06 per share) and net gain on sale of the division of $75.1 million ($1.51 per share). l From continuing operations; excludes net income from discontinued operations of $8.2 million ($0.61 per share) and net gain on sale of pharmaceuticals business of $79.8 million ($5.92 per share). m Excludes net income from discontinued lead antiknock compounds operations of $3.1 million ($0.08 per share). n Excludes net loss on discontinued Industrial Bio-Test Laboratories operations of $6.2 million ($0.16 per share). o From continuing operations; includes special charge for restructuring costs, before taxes, of $330.0 million but excludes net income and net gain on sale of Ecusta paper and film businesses of $24.9 million ($1.09 per share). p Excludes special charge for DOT claims, net, of $9.5 million ($0.40 per share).

Year	Net sales	Net income	Total assets	Current ratio	Net plant and equipment	Capital expenditures	Net worth	NET INCOME % of sales	NET INCOME % of net worth	NET INCOME $ per share	Dividends, $ per share	Dividend yield, % of price	Stock price range, $ per share	Price-earnings ratio
	Money figures in thousands of dollars unless otherwise indicated													
Pennwalt Corp.														
1985	$1,013,308	$11,219[b]	$937,672	1.5	$433,967	$99,691	$323,263	1.1%	3.5%	$0.85[c]	$2.20	5.0%	$44½–34	785.9
1984	1,047,214	45,356	868,673	1.9	393,765	87,177	485,325	4.3	9.3	3.31	2.20	6.0	42½–31½	11.1
1983	976,741	44,790[b]	851,982	2.6	348,190	69,808	458,077	4.6	9.8	3.58[b]	2.20	5.9	45¾–29	10.4
1982	952,400	24,562[b]	737,048	1.6	342,785	76,486	346,364	2.6	7.1	2.37[b]	2.20	7.8	34⅞–21½	11.9
Reichhold Chemicals														
1985	$822,534	($28,432)[d,j]	$451,903	1.2	$203,972	$35,057	$134,714	—	—	($3.85)[d,j]	$0.80	2.2%	$43½–29¾	—
1984	901,355	25,709	371,619	2.0	172,219	24,228	206,421	3.2%	12.5%	3.63	0.65	2.2	35⅝–23	7.5
1983	747,263	21,700	382,273	2.0	175,722	19,305	211,081	2.9	10.3	2.74	0.51	1.8	39⅞–18¼	10.4
1982	814,911	6,875[j]	364,133	2.5	159,181	20,516	200,546	0.8	3.4	0.57[j]	0.48	3.2	19⅝–16	26.9
Rohm & Haas Co.														
1985	$2,051,000	$141,000[b]	$1,619,000	2.0	$581,000	$150,000	$821,000	6.9%	17.2%	$2.01[b]	$0.70	3.1%	$26½–18⅝	11.1
1984	2,042,011	172,219[b]	1,540,570	2.0	555,945	134,253	872,887	8.4	19.7	2.24[b]	0.60	3.1	23½–16	8.7
1983	1,875,937	137,603	1,489,815	2.7	518,360	71,534	882,964	7.3	15.6	1.78	0.50	2.5	27–12⅝	11.1
1982	1,828,027	85,805[j]	1,365,163	2.5	546,623	125,927	807,853	4.7	10.6	1.11[j]	0.47	4.5	13½–7⅝	9.4
Stepan Co.														
1985	$235,919	$5,471	$139,307	1.5	$82,796	$19,189	$49,575	2.3%	11.0%	$1.89	$0.60	3.5%	$23½–16⅝	10.5
1984	234,930	5,423[j]	133,941	1.6	73,261	11,557	47,660	2.3	11.4	1.86[j]	0.65	3.9	19⅝–14½	10.9
1983	207,074	6,337	144,997	1.5	76,044	9,804	58,450	3.1	10.8	1.75	0.56	3.9	17½–12	8.4
1982	208,373	5,303	163,326	1.3	75,475	16,148	55,067	2.5	9.6	1.45	0.56	4.1	16⅛–9⅛	9.4
Sun Chemical Corp.														
1985	$883,864	$ 4,069[b]	$666,118	1.4	$202,984	$45,196	$187,735	0.5%	2.2%	$0.52[b]	$0.48	1.4%	$ 39–28⅝	84.8
1984	872,948	25,218	587,932	2.0	178,292	38,052	174,164	2.9	14.5	3.23	0.48	1.7	33–24⅛	8.9
1983	746,809	9,529	497,715	1.8	141,771	27,666	157,917	1.3	6.0	1.24	0.48	2.0	30⅜–17⅞	19.6
1982	664,257	14,871[j]	523,799	1.9	134,351	27,371	162,130	2.2	9.2	1.97[j]	0.48	2.6	24⅛–13⅛	9.5
Union Carbide Corp.														
1985[a]	$8,596,000	($38,000)[d]	$ 8,461,000	1.3	$4,927,000	$ 649,000	$ 519,000	—	—	($0.38)[d]	$1.13	6.1%	$24⅜–12	—
1984	9,508,000	341,000[b]	10,402,000	1.8	6,383,000	670,000	4,808,000	3.6%	7.1%	1.61[b]	1.13	6.9	21⅝–16⅞	10.1
1983	9,001,000	218,000[b]	10,226,000	1.8	6,282,000	761,000	4,860,000	2.4	4.5	1.04[b]	1.13	5.4	24⅝–17	20.1
1982	9,061,000	310,000	10,552,000	1.9	6,356,000	1,179,000	5,095,000	3.4	6.1	1.49	1.13	6.7	20⅝–13⅜	11.3
Williams Cos.														
1985	$3,139,600	$ 31,600	$4,337,400	0.9	$2,786,400	$259,000	$1,212,900	1.0%	2.6%	$0.92	$1.40	4.7%	$32⅞–28⅛	32.3
1984	3,388,700	144,500[b]	4,534,000	1.0	3,252,800	282,000	1,284,000	4.3	11.3	4.21[b]	1.25	4.6	31½–23	6.5
1983	2,167,000	54,000	4,686,400	0.7	3,193,000	253,400	1,173,900	2.5	4.6	1.79	1.20	5.1	30⅛–16⅝	13.1
1982	1,691,315	29,682[b]	2,369,791	1.7	1,513,712	171,695	1,029,411	1.8	2.9	1.00[b]	1.20	5.6	29⅝–13⅛	21.2
Witco Corp.														
1985	$1,448,929	$56,774	$794,368	2.3	$360,950	$71,093	$399,486	3.9%	14.2%	$3.85	$1.48	4.0%	$41⅛–33	9.7
1984	1,495,831	62,602	739,488	2.2	348,740	65,720	358,497	4.2	17.5	4.28	1.40	4.2	39½–27⅝	7.8
1983	1,385,744	52,022	715,472	2.1	313,794	44,901	319,334	3.8	16.3	3.60	1.26	4.6	37⅛–17⅝	7.6
1982	1,305,418	29,842	643,911	2.2	291,914	54,130	281,013	2.3	10.6	2.10	1.26	7.2	19⅝–15⅛	8.9
PHARMACEUTICALS														
Abbott Laboratories														
1985	$3,360,273	$485,335	$3,468,373	1.9	$1,368,542	$292,900	$1,870,563	13.9%	24.9%	$3.88	$1.40	2.5%	$ 72–39⅞	14.4
1984	3,103,962	402,575	3,172,897	1.7	1,236,572	334,800	1,602,700	13.0	25.1	3.34	1.20	2.8	48⅝–36⅝	12.8
1983	2,927,873	347,617	2,824,128	1.7	1,069,200	311,800	1,417,883	11.9	24.5	2.86	1.00	2.2	53⅜–36⅛	15.6
1982	2,682,447	289,123	2,566,900	1.1	901,050	286,600	1,310,886	11.1	22.1	2.37	0.84	2.5	41⅛–25⅝	14.1
American Home Products Corp.														
1985	$4,684,742	$717,140	$3,201,746	3.3	$859,414	$179,347	$2,098,293	15.3%	34.2%	$4.70	$2.90	5.0%	$88⅞–50⅛	12.4
1984	4,485,470	655,829[f]	2,849,732	3.3	769,623	141,891	1,905,733	14.6	34.4	4.29[f]	2.64	5.2	55⅝–46⅝	12.0
1983	4,856,501	627,233	2,884,104	2.9	812,370	204,680	1,826,964	12.9	34.3	4.00	2.40	5.0	54⅛–41⅞	12.9
1982	4,582,096	560,163	2,602,346	2.6	725,352	153,812	1,614,192	12.2	34.7	3.59	2.15	5.3	48–33⅛	11.3
Baxter Travenol Laboratories														
1985	$2,335,000	$137,000	$6,839,000	1.8	$1,682,000	$198,000	$2,963,000	5.9%	4.6%	$0.85	$0.37	2.5%	$16⅝–12½	17.2
1984	1,800,422	145,147[b]	2,000,753	1.5	767,636	171,652	1,106,731	8.1	13.1	1.03[b]	0.33	1.8	24⅞–11¾	17.8
1983	1,842,544	218,055	2,127,037	1.6	746,304	192,464	1,151,109	11.8	18.9	1.54	0.28	1.1	31½–20	16.6
1982	1,671,445	186,885	1,792,710	1.9	628,720	148,812	1,061,000	11.2	17.6	1.32	0.23	1.1	25½–15⅞	15.4

a From continuing operations; includes special charge for restructuring program, before taxes, of $38.6 million but excludes net loss from operations and on disposal of discontinued dental businesses of $30.9 million ($2.80 per share). b Includes gain on sale, retirement, and revaluation of assets, before taxes, of $21.7 million. c From continuing operations; excludes provision for loss on disposal of discontinued operations of $2.8 million ($0.27 per share). d Deficit. e Includes special charge for restructuring program, before taxes, of $39.6 million. f Excludes net loss resulting from asset redeployment/divestiture program of $2.2 million ($0.32 per share). g Includes net gain on disposal of assets of $4.6 million ($0.07 per share). h Includes net gain on sale of oil and gas properties of $3.6 million ($0.05 per share). i Includes net gain on shutdown and disposal of assets of $10.4 million ($0.40 per share). j Includes nonrecurring net loss on writedown of equipment of $2.6 million. k Includes loss on disposal of assets, before taxes, of $9.1 million. l From continuing operations; excludes equity in net loss of affiliate's discontinued operations of $12.9 million ($1.71 per share). m Pro forma, after adjustment for repurchase of common stock, sale of consumer products businesses, special charges for restructuring program, and other special gains and losses. n Excludes extraordinary charge related to accident in Bhopal, India, of $18 million ($0.06 per share). o Excludes nonrecurring net charge for closing of facilities of $139 million ($0.66 per share). p Excludes net loss from operations and net gain on disposition of Edgcomb Metals Co. operations of $5.0 million ($0.15 per share). q From continuing operations; excludes net income from discontinued operations of $4.7 million ($0.15 per share). r From continuing operations; excludes net income from operations and net gain on sale of discontinued businesses of $76.3 million ($0.50 per share). s Excludes special net charge for closing three plants and revaluation of assets of $116.1 million ($0.87 per share).

Year	Net sales	Net income	Total assets	Current ratio	Net plant and equipment	Capital expenditures	Net worth	NET INCOME % of sales	NET INCOME % of net worth	NET INCOME $ per share	Dividends, $ per share	Dividend yield, % of price	Stock price range, $ per share	Price-earnings ratio
	Money figures in thousands of dollars unless otherwise indicated													
Bristol-Myers Co.														
1985	$4,444,000	$531,400	$3,557,300	2.3	$925,800	$222,000	$2,287,100	12.0%	23.2%	$3.86	$1.81	3.1%	$68⅛–48	15.2
1984	4,189,400	472,400	3,190,800	2.4	791,100	191,600	1,998,100	11.3	23.6	3.45	1.50	3.2	52⅝–41	13.6
1983	3,917,000	408,000	2,888,300	2.2	701,700	165,000	1,788,900	10.4	22.8	3.00	1.16	2.9	47⅞–31⅛	13.2
1982	3,599,900	348,700	2,665,800	2.2	653,600	170,000	1,624,000	9.7	21.5	2.50	1.02	3.3	37–25⅝	12.0
Eli Lilly & Co.														
1985	$3,270,600	$517,600	$3,859,400	1.7	$1,374,000	$207,100	$2,293,400	15.8%	22.6%	$3.69	$1.60	3.0%	$55⅞–32⅛	11.2
1984	3,109,200	490,200	3,556,500	1.6	1,280,400	205,300	2,133,800	15.8	23.0	3.36	1.49	4.9	33⅝–26½	9.0
1983	3,033,700	457,400	3,401,200	1.7	1,212,600	199,900	2,108,400	15.1	21.6	3.06	1.375	4.4	34⅛–28⅛	10.2
1982	2,962,711	411,828	3,155,125	1.8	1,135,575	236,642	2,055,460	13.9	20.0	2.71	1.30	4.7	32⅝–22½	10.2
Merck & Co.														
1985	$3,547,500	$539,900	$4,805,100	1.9	$1,882,800	$237,600	$2,536,900	15.2%	21.3%	$3.79	$1.60	2.8%	$58⅞–45⅛	15.0
1984	3,559,665	492,967	4,489,697	1.9	1,912,778	274,425	2,443,260	13.8	20.2	3.35	1.50	3.4	48⅝–39⅛	13.1
1983	3,246,139	450,855	4,119,098	1.7	1,715,207	272,756	2,339,013	13.9	19.3	3.05	1.40	3.0	52⅞–40⅞	15.3
1982	3,063,017	415,137	3,591,652	1.9	1,557,490	295,106	2,147,988	13.6	19.3	2.80	1.40	3.7	44⅛–32	13.6
Pfizer														
1985	$4,024,500	$579,700	$4,341,500	2.1	$1,268,300	$195,800	$2,805,900	14.4%	20.7%	$3.44	$1.48	3.2%	$56⅛–37⅝	13.6
1984	3,854,500	507,900	3,927,700	2.1	1,155,600	144,000	2,365,100	13.2	21.5	3.08	1.32	3.7	42⅝–29⅝	11.6
1983	3,750,000	447,100	3,830,000	2.0	1,157,000	214,900	2,074,700	11.9	21.6	2.73	1.16	3.0	44⅜–33⅝	14.4
1982	3,453,600	332,800	3,644,500	1.9	1,124,700	265,500	1,869,500	9.6	17.8	2.13	0.92	2.6	40⅝–25	15.3
A. H. Robins Co.														
1985	$706,134	$61,414[a]	$620,710	3.7	$149,954	$23,150	($132,933)[b]	8.7%	—	$2.53	$0.00	—	$24⅜–5½	5.9
1984	631,891	(461,613)[c]	565,627	1.5	135,685	38,155	(210,353)[c]	—	—	(18.44)[c]	0.72	4.1%	23⅛–12⅜	—
1983	563,510	58,221[d]	459,462	3.1	107,651	20,955	305,638	10.3	19.0%	2.40	0.62	2.7	29⅝–16	9.5
1982	482,324	45,693[e]	386,843	3.8	98,079	15,815	267,945	10.1	18.2	1.90	0.52	3.3	20⅛–11⅛	7.9
Schering-Plough Corp.														
1985	$1,927,100	$192,600	$2,683,800	1.4	$991,800	$140,300	$1,389,600	10.0%	13.9%	$3.77	$1.68	3.3%	$66½–35⅛	13.5
1984	1,874,300	177,200	2,436,200	1.2	912,400	173,700	1,235,100	9.5	14.3	3.50	1.68	4.6	40–33	10.4
1983	1,808,500	178,500[f]	2,309,800	1.3	841,400	177,700	1,186,500	9.9	15.0	3.40[f]	1.68	4.0	48⅛–36⅜	12.5
1982	1,817,900	183,500	2,341,200	1.8	747,500	180,400	1,278,500	10.1	14.4	3.39	1.68	4.8	43⅜–26⅛	10.3
SmithKline Beckman Corp.														
1985	$3,256,600	$514,400	$3,534,500	1.8	$1,285,300	$248,000	$2,070,100	15.8%	24.8%	$6.56	$2.85	4.3%	$79⅝–52⅜	10.1
1984	2,9[illegible]	500,300[g]	3,077,600	2.0	1,093,000	241,500	1,952,100	17.0	25.6	6.19[g]	2.80	5.1	66⅛–50	8.9
1983	2,[illegible]	485,990[h]	3,085,409	1.8	988,857	232,914	1,970,793	17.1	24.7	5.85[h]	2.65	4.0	76⅛–55⅛	11.3
1982	2,908,667	455,157	2,765,900	2.1	971,302	304,784	1,749,407	15.3	26.0	5.51	2.39	3.5	77⅝–57⅜	12.3
Squibb Corp.														
1985	$2,041,745	$226,599	$2,396,592	2.0	$701,439	$120,342	$1,409,382	11.1%	16.1%	$4.29	$1.72	2.6%	$82⅛–49⅜	15.7
1984	1,886,037	197,172	2,072,188	2.1	617,724	115,629	1,266,517	10.5	15.6	3.68	1.48	3.2	54⅜–37½	12.5
1983	1,768,891	173,274[i]	1,887,783	2.2	564,613	109,800	1,173,399	9.8	14.8	3.31[i]	1.365	2.8	55⅝–42⅛	14.9
1982	1,660,766	153,636	1,871,882	2.1	511,821	87,280	1,037,989	9.3	14.8	3.01	1.28	3.2	50½–29	13.2
Sterling Drug														
1985	$1,753,724	$153,310[j]	$1,588,991	2.0	$358,190	$74,176	$907,646	8.7%	16.9%	$2.56[j]	$1.19	3.5%	$41⅞–26⅜	13.3
1984	1,827,295	144,853[k]	1,429,618	2.5	370,273	73,158	894,943	7.9	16.2	2.30[k]	1.15	4.3	30–23½	11.2
1983	1,901,171	136,844	1,437,440	2.5	366,328	63,189	879,655	7.2	15.6	2.24	1.11	4.3	29⅝–22⅛	11.6
1982	1,796,153	131,970	1,297,989	2.6	356,535	80,068	825,944	7.3	16.0	2.17	1.06	4.3	29⅝–19⅛	11.4
Upjohn Co.														
1985	$2,008,486	$203,193[l]	$2,376,873	1.8	$852,054	$152,637	$1,295,085	10.1%	15.7%	$3.29[l]	$1.34	2.6%	$70⅝–33⅜	15.8
1984	2,179,060	173,272	2,248,363	1.5	809,534	136,738	1,134,154	8.0	15.3	2.83	1.28	4.4	36–22½	10.3
1983	1,986,106	160,225	2,195,048	1.9	754,954	155,016	1,057,288	8.1	15.2	2.64	1.175	4.1	34⅜–23⅛	10.9
1982	1,823,730	126,020	2,013,985	1.9	675,869	137,273	973,028	6.9	13.0	2.00	1.14	4.7	29⅝–19	11.8
Warner-Lambert Co.														
1985	$3,200,069	$237,704[m]	$2,286,187	1.2	$868,931	$138,774	$819,279	7.4%	29.0%	$3.05[m]	$1.50	3.2%	$49⅜–33⅛	13.6
1984	3,166,657	223,887	2,377,098	1.5	863,179	142,461	910,125	7.1	24.6	2.81	1.48	4.6	36⅛–28⅝	11.5
1983	3,108,325	200,496	2,368,879	1.7	826,232	165,854	969,980	6.5	23.0	2.51	1.42	4.7	35–25⅝	12.1
1982	3,245,967	174,970[n]	2,344,259	1.9	768,571	153,567	815,864	5.4	21.4	2.20[n]	1.40	5.6	30⅛–19⅝	11.3

a Excludes extraordinary net gain from tax benefit associated with operating loss carry-forward of $14.4 million ($0.59 per share). b Net loss; includes income, before taxes, from litigation settlement of $1.2 million and net charge for reserve for Dalkon Shield claims of $489.1 million ($19.53 per share). c Deficit. d Includes income, before taxes, from litigation settlement of $2.3 million. e Includes income, before taxes, from litigation settlement of $3.1 million. f From continuing operations; excludes net gain on sale of discontinued home products business of $11.6 million ($0.22 per share). g Excludes net gain on sale of Industrial Business Group of $3.3 million ($0.04 per share). h From continuing operations; excludes net income of discontinued Industrial Business Group of $3.5 million ($0.04 per share). i Excludes extraordinary net gain on early extinguishment of debt of $27.0 million ($0.52 per share) and net loss on disposal of Latin American operations of $27.6 million ($0.53 per share). j From continuing operations; excludes net loss from divested Hilton-Davis chemical business of $43.6 million ($0.73 per share). k From continuing operations; excludes net loss on operations of divested environmental control business of $1.5 million ($0.02 per share). l From continuing operations; excludes net loss from operations and sale of polymer chemical business of $238,000. m Excludes nonrecurring net charge for write-down and divestiture of assets and restructuring program of $553.3 million ($7.10 per share). n Includes nonrecurring net credit of $12 million ($0.15 per share).

Chemical work force drops steeply in 1985

In 1985, the number of workers employed by the U.S. chemical industry fell to about 1,042,000, the lowest level of employment since 1975. A steady decline throughout 1985 and in the early months of 1986 wiped out the modest recovery that occurred in 1984. Employment also dropped again in the petroleum industry last year, but rubber manufacturers continued a trend toward higher numbers of workers.

Despite the overall downturn, two chemical sectors—soaps, cleaners, and toilet goods and paints and allied products—added a modest number of employees in 1985. Employment held steady in the industrial inorganic and organic chemicals segments. However, producers of plastics, synthetics, drugs, and agricultural chemicals trimmed their work forces.

Major chemical companies, as a group, added employees in 1985. Notable among the giant firms were Dow Chemical, which increased employment last year after several years of cuts, and Union Carbide, which cut back sharply on the number of its workers.

Chemical employment has declined steadily since the end of 1984

a Seasonally adjusted employment in U.S. chemicals and allied products industry; March and April 1986 figures are preliminary. **Source:** Department of Labor

INDUSTRIAL EMPLOYMENT: Stagnant at best throughout chemical industry

	All employees[a] (thousands)				Production workers[a] (thousands)				Workweek[a,b] (hours)			
	1985	1984	1983	1975	1985	1984	1983	1975	1985	1984	1983	1975
All manufacturing	19,426	19,412	18,434	18,323	13,214	13,310	12,530	13,043	40.5	40.7	40.1	39.5
Chemicals and allied products	1,042	1,048	1,043	1,015	576	582	579	580	41.9	41.9	41.6	41.0
Industrial inorganic chemicals	143	143	151	149	72	72	77	90	41.7	42.1	41.5	41.4
Plastic materials and synthetics	168	177	176	218	112	117	115	136	42.3	42.2	42.0	40.6
Drugs	205	206	201	167	94	96	98	84	41.0	40.7	41.0	41.0
Soap, cleaners, and toilet goods	148	145	142	122	94	93	89	73	41.0	41.3	41.1	40.6
Paints and allied products	63	62	60	62	30	30	29	33	41.4	41.7	41.0	40.5
Industrial organic chemicals	164	164	163	150	84	83	84	74	43.3	43.0	42.5	41.3
Agricultural chemicals	60	61	60	65	37	38	36	42	42.7	42.8	42.1	42.5
Miscellaneous chemical products	92	92	89	82	53	53	50	47	41.8	41.8	41.3	40.4
Petroleum and coal products	177	189	196	194	108	111	118	123	43.0	43.7	43.9	41.2
Rubber and miscellaneous plastics products	795	782	711	608	615	609	551	465	41.1	41.7	41.2	39.9

a Domestic employment. b Workweek of production or nonsupervisory workers. **Source:** Department of Labor

EMPLOYMENT OF SCIENTISTS, ENGINEERS: Down slightly for chemical producers

Thousands[a]	1985[b]	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975
Total, all industry	570.3	544.5	522.1	509.8	487.8	450.6	423.9	404.4	382.8	364.4	363.3
Chemicals and allied products	66.9	67.1	66.0	61.6	54.7	51.4	50.0	48.3	46.4	44.4	45.2
Industrial chemicals	25.1	26.7	27.2	25.9	21.6	20.9	21.4	21.3	20.6	20.1	21.1
Drugs and medicines	30.9[c]	30.1[c]	28.2	25.6	23.3	21.6	20.8	19.5	17.8	16.6	15.6
Other chemicals	10.9	10.3	10.6	10.1	9.8	8.9	7.8	7.5	8.0	7.8	8.5
Petroleum refining	13.4	13.2	14.7	15.6	13.0	10.8	10.1	9.9	8.9	8.6	8.4
Rubber products	na	na	na	8.1	10.3	na	8.1	7.9	9.1	8.6	8.4

a Full-time equivalent number of R&D scientists and engineers in industry, as of January of each year. b Preliminary. c Partly estimated. na = not available separately, but included in total. **Source:** National Science Foundation

CHEMICAL EMPLOYMENT: Modest growth last year, but sales per employee declines

Thousands	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976
Air Products	18.7	17.7	16.7	16.9	16.2	15.8	14.6	14.3	13.7	13.4
American Cyanamid	36.4	38.2	38.7	40.2	41.8	42.6	44.2	44.0	43.8	39.4
Celanese	18.5	21.5	23.3	25.3	29.5	30.8	31.5	31.8	30.9	30.8
Crompton & Knowles	2.3	2.3	2.4	2.3	2.5	2.8	3.0	3.2	3.1	3.0
Dow Chemical	53.2	49.8	54.5	56.6	63.8	56.8	55.9	53.5	53.2	53.0
Ethyl	10.5	11.0	13.0	14.0	14.5	15.0	16.0	16.5	16.0	16.0
Freeport-McMoRan	4.5	4.6	4.8	5.0	5.2	2.7	3.9	3.5	3.7	3.8
H. B. Fuller	4.4	4.3	4.1	4.0	3.3	3.4	3.4	3.3	3.0	2.8
W. R. Grace	116.9	102.6	95.5	82.2	89.0	92.0	82.8	69.1	69.1	64.0
Hercules	25.4	26.3	24.2	24.5	25.9	26.1	27.4	27.1	26.3	25.7
International Flavors	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.5	3.3	3.1
International Minerals	8.7	9.0	8.4	8.4	10.6	10.6	10.3	9.9	9.9	9.7
Lubrizol	5.2	4.2	4.2	4.3	4.2	4.2	3.9	3.8	3.6	3.6
Monsanto	56.1	50.8	48.8	52.2	57.4	61.8	63.9	62.9	61.5	61.9
Nalco Chemical	5.1	4.8	4.6	4.6	4.7	4.3	4.1	4.1	4.2	3.8
Olin	14.9	17.8	18.2	17.5	20.3	21.0	21.7	22.7	22.4	22.0
Pennwalt	9.9	9.8	9.8	9.5	10.7	12.8	13.3	14.0	13.9	13.9
PPG Industries	37.5	37.7	37.0	37.0	36.6	37.3	38.2	37.4	36.6	36.3
Reichhold Chemicals	4.6	4.2	4.4	4.5	5.6	5.6	6.4	6.5	6.5	5.8
Rohm & Haas	11.8	11.9	11.4	11.5	13.5	13.2	13.3	13.1	13.0	13.3
Stepan	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.7
Union Carbide	91.5	98.4	99.5	103.2	110.3	116.1	115.8	113.4	113.7	113.1
TOTAL EMPLOYEES	540.7	531.7	528.1	530.2	570.1	579.3	578.1	558.4	552.2	539.1
ANNUAL CHANGE	1.7%	0.7%	−0.4%	−7.0%	−1.6%	0.2%	3.5%	1.1%	2.4%	−1.1%
SALES PER EMPLOYEE ($ thousands, current)	$115.5	$117.5	$111.6	$108.6	$110.7	$103.3	$94.2	$81.0	$74.2	$69.0
SALES PER EMPLOYEE ($ thousands, constant 1972[a])	$39.7	$40.7	$39.7	$38.7	$40.1	$41.3	$44.2	$42.4	$40.1	$38.4

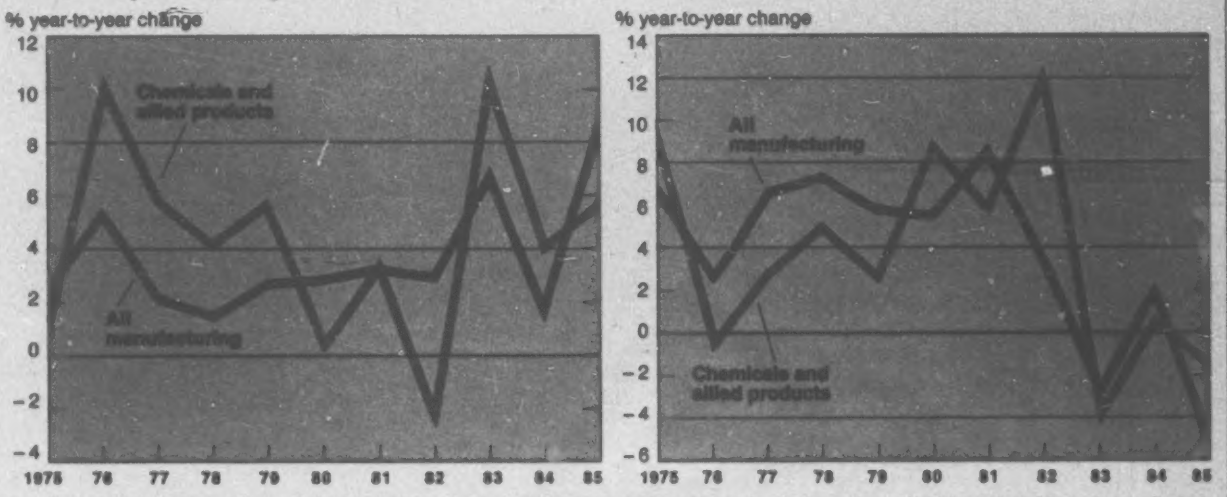
a Based on producer price index for chemicals and allied products. **Note:** Data are not restated for acquisitions, divestitures, and similar changes. Data for 1985 do not account for work-force reductions that took effect during first-quarter 1986.

WAGES: Organic chemical workers continue to earn highest wages in chemical industry

	Hourly earnings[a]				Weekly earnings[a]			
	1985	1984	1983	1975	1985	1984	1983	1975
All manufacturing	$ 9.52	$ 9.18	$ 8.83	$4.83	$385.56	$373.63	$354.08	$190.79
Chemicals and allied products	11.57	11.08	10.58	5.39	484.78	464.25	440.13	220.99
Industrial inorganic chemicals	12.82	12.30	11.66	5.73	534.59	517.83	483.89	237.22
Plastic materials and synthetics	11.72	11.10	10.55	5.26	495.76	468.42	443.10	214.37
Drugs	10.75	10.23	9.72	5.18	440.75	416.36	398.52	212.38
Soap, cleaners, and toilet goods	10.26	9.89	9.65	5.15	420.66	408.46	396.62	209.09
Paints and allied products	10.07	9.75	9.34	5.01	416.90	406.58	382.94	202.91
Industrial organic chemicals	13.99	13.43	12.73	6.25	605.77	577.49	541.03	258.13
Agricultural chemicals	11.02	10.73	10.24	4.93	470.55	459.24	431.10	209.53
Miscellaneous chemical products	10.60	10.08	9.63	5.11	433.08	421.34	397.72	206.44
Petroleum and coal products	14.04	13.43	13.28	6.48	603.72	586.89	582.99	266.98
Rubber and miscellaneous plastic products	8.53	8.29	8.00	4.39	350.58	345.69	329.60	175.16

a For production and nonsupervisory workers in domestic employment. **Source:** Department of Labor

Chemical productivity rebounded in 1985 . . . . . thus unit labor costs fell slightly



Note: Productivity is output per workhour, calculated by dividing indexes for production by indexes for workhours of production employees. Unit labor costs are labor costs per unit output, calculated by dividing indexes for wages by indexes for output per workhour. **Sources:** Department of Labor, Federal Reserve Board, C&EN calculations

Productivity in the U.S. chemical industry improved in 1985, but most of the increase came as a result of falling employment rather than from increased production. And in spite of the improvement, productivity gains for manufacturers of chemicals and allied products lagged those for all manufacturing industries.

In 1985, production of chemicals increased 3.4% but work hours in the chemical industry declined 2.4%. As a result, productivity increased 5.9%, compared with a 4.0% increase in 1984.

At the same time, chemical producers were holding labor costs in check. Hourly production wages in 1985 increased just 4.3% over the year before. Consequently, unit labor costs fell to their lowest level since 1981. Unit labor costs in 1985 were down 1.5%, compared with a 0.7% rise in 1984 over the previous year.

However, for all manufacturing, improvements in the productivity scene was even better. For all manufacturing, productivity had increased 9.2% on a 6.7% rise in production and a 2.2% fall in workhours. In 1984, productivity for all manufacturing was up only 1.5% from the year before.

Like productivity, unit labor costs for all manufacturing outperformed chemicals, falling 5.4% from the year before on a 3.3% rise in hourly production wages. In 1984, unit labor costs for all manufacturing were up 2.3%.

PRODUCTIVITY: Improvement last year as output rises despite a decline in workhours

Indexes, 1977 = 100	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975
CHEMICALS & ALLIED PRODUCTS											
Production	127.1	122.9	115.7	105.6	116.0	111.1	113.3	106.3	100.0	92.0	79.3
Workhours	93.7	96.0	93.9	95.2	101.7	101.0	103.1	102.2	100.0	97.3	92.6
Productivity	135.6	128.0	123.1	110.9	114.1	110.0	109.9	104.0	100.0	94.6	85.6
Hourly production wages	180.2	172.7	164.8	155.0	141.8	129.2	118.2	109.2	100.0	91.9	83.8
Unit labor costs	132.9	134.9	133.9	139.7	124.4	117.5	107.6	105.0	100.0	97.2	97.9
ALL MANUFACTURING											
Production	127.1	119.1	107.1	99.4	108.6	105.9	110.7	106.1	100.0	94.1	84.0
Workhours	93.9	96.0	87.7	87.0	97.9	98.9	106.2	104.5	100.0	96.1	90.4
Productivity	135.4	124.0	122.2	114.3	110.9	107.1	104.2	101.5	100.0	97.9	92.9
Hourly production wages	166.9	161.5	155.4	149.6	140.7	128.1	118.0	108.6	100.0	91.9	86.0
Unit labor costs	123.2	130.2	127.3	130.9	126.8	116.6	113.2	107.0	100.0	93.8	91.5

Sources: Department of Labor, Federal Reserve Board, C&EN estimates

World chemical trade cools off

World chemical trade cooled off last year. After a 7.5% jump in 1984, world chemical exports slipped nearly 3% to an estimated $142.5 billion.

World trade numbers, however, have to be taken with a grain of salt. To determine a total world chemical export figure, it's necessary to go to several different sources, including the United Nations (always two years late with its data), the Organization for Economic Cooperation & Development (always one year late), the European Economic Community, and several individual countries. The big problem, of course, lies in the way these various organizations use exchange rates to convert foreign currencies into U.S. dollars.

Although currency conversion always is a problem, in the past few years, and especially last year, the problem was compounded because the exchange rate for U.S. dollars fluctuated wildly.

Nevertheless, it seems apparent that several major chemical exporters suffered setbacks last year. Chemical exports from EEC, for one thing, were down.

EEC exports to the U.S., however, increased a healthy 11% last year. The losses in chemical exports, then, had to come from developing country markets, just as was the case for exports by U.S. chemical producers.

U.S. chemical exports dipped 2% last year to $21.5 billion. Shipments held up adequately to such developed markets as Western Europe, Japan, and Canada. But important markets in developing areas, particularly Latin America and Asia, weakened considerably. Many countries in those regions cut back on imports to cope with their own domestic economic problems. Meanwhile, the expected improvement in U.S. chemical exports as a result of the weakening dollar had not yet taken hold.

U.S. TOTAL TRADE BALANCE: Slips further into the red

$ Billions	1985	1984	1983	1975
Total exports	$213.1	$217.9	$200.5	$107.1
Total imports	345.3	325.7	258.0	98.1
Trade balance	−132.2	−107.8	−57.5	11.0

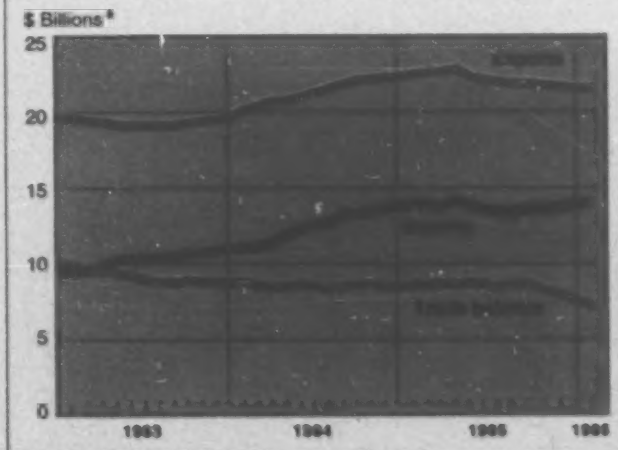
Source: Department of Commerce

U.S. CHEMICAL TRADE BALANCE: The surplus continues to erode

$ Millions	1985	1984	1983	1975
Chemical exports	$21,759	$22,336	$19,751	$8705
Chemical imports	14,533	13,697	10,779	3696
Chemical trade balance	7,226	8,639	8,972	5009

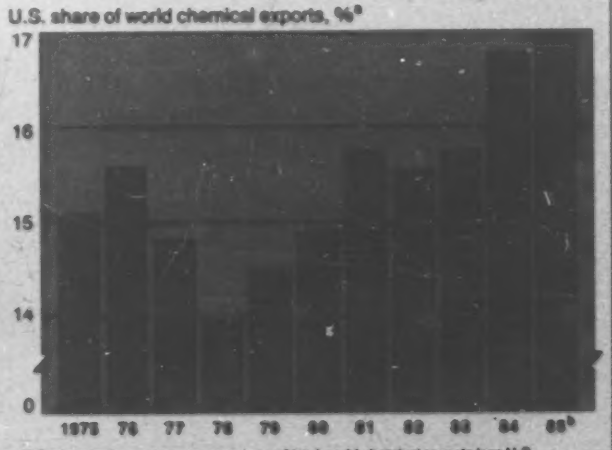
Source: Department of Commerce

Chemical trade balance shrinks further . . .



a Running 12-month totals. Source: Department of Commerce

. . . but U.S. share of world markets climbs



a U.S. chemical exports as a percentage of total world chemical exports less U.S. chemical imports. b C&EN estimate. Source: Department of Commerce

WORLD TRADE: Chemical business cools

$ Millions	1985	1984	1983	1975
CHEMICAL EXPORTS				
World	$142,500[a]	$146,421	$136,260	$61,212
U.S.	21,759	22,336	19,751	8,705
Canada	4,132	4,187	3,645	1,063
EEC, 10 countries	68,871	73,307	70,104	32,697
Belgium-Luxembourg	6,450	6,449	6,216	3,460
France	12,623	12,574	11,842	5,405
Italy	5,497	6,203	6,116	2,681
Netherlands	9,838	11,005	10,536	5,076
U.K.	9,106	11,014	10,491	4,826
West Germany	22,477	23,369	22,209	10,447
Switzerland	5,878	5,503	5,539	2,760
Japan	7,697	7,447	6,813	3,885
CHEMICAL IMPORTS				
U.S.	14,533	13,697	10,779	3,696
Canada	4,549	4,544	4,052	1,772
EEC, 10 countries	57,273	53,601	51,382	22,094
Belgium-Luxembourg	5,855	5,437	5,184	2,522
France	10,854	9,973	9,533	4,337
Italy	8,518	7,813	7,307	2,805
Netherlands	6,825	5,804	5,534	2,677
U.K.	7,425	8,470	7,764	3,123
West Germany	13,858	13,084	12,494	5,218
Switzerland	3,664	3,397	3,315	1,447
Japan	8,072	8,112	7,008	2,059

a C&EN estimate. Sources: United Nations, Organization for Economic Cooperation & Development, European Economic Community, individual country data

U.S. TRADE: More with Europe

$ Millions	1985	1984	1983	1975
U.S. CHEMICAL EXPORTS				
Canada	$ 2,698	$ 2,752	$ 2,546	$1223
Western Europe	6,742	6,497	5,892	2699
Eastern Europe	368	275	306	84
Communist Asia	513	645	353	5
Japan	2,908	2,961	2,607	589
Rest of Asia	3,024	3,292	2,859	990
Middle East	400	429	423	272
Latin America	3,681	3,827	3,273	2135
Australasia	704	842	696	248
Africa	456	510	492	271
Other	265	306	304	189
TOTAL	$21,759	$22,336	$19,751	$8705
U.S. CHEMICAL IMPORTS				
Canada	$ 2,913	$ 3,131	$ 2,390	$ 870
Western Europe	7,118	6,392	5,020	1709
Eastern Europe	380	325	197	23
Communist Asia	163	157	131	16
Japan	1,412	1,312	1,099	387
Rest of Asia	457	377	283	42
Middle East	218	124	113	40
Latin America	1,216	1,208	924	144
Australasia	231	251	234	240
Africa	203	196	227	24
Other	222	224	161	201
TOTAL	$14,533	$13,697	$10,779	$3696

Source: Department of Commerce

U.S. TRADE, BY PRODUCTS: Organic chemicals, plastics, and drugs lead advance in imports

$ Millions	Chemical exports				Chemical imports			
	1985	1984	1983	1975	1985	1984	1983	1975
Organic chemicals	$ 6,012	$ 6,093	$ 5,326	$2431	$ 4,576	$ 4,265	$ 3,477	$1042
Inorganic chemicals	1,967	2,184	1,838	943	1,984	2,064	1,615	835
Radioactive materials	1,311	1,421	1,213	314	1,417	1,394	952	196
Dyeing, tanning, and coloring materials	139	158	163	92	352	358	300	75
Pigments, paints, and varnishes	322	335	328	152	266	232	145	28
Medicinals and pharmaceuticals	2,708	2,628	2,494	866	1,084	931	703	235
Flavors, perfumes, cosmetics, toiletries	478	498	493	190	577	521	370	115
Cleaning and polishing materials	292	308	295	172	172	118	90	30
Fertilizer, manufactured	2,160	1,815	1,267	1083	987	1,142	997	626
Explosives and pyrotechnics	100	146	87	60	103	84	64	25
Plastics and resins	3,777	4,050	3,732	1173	1,631	1,484	1,098	227
Pesticides and disinfectants	614	707	630	a	399	308	251	a
Miscellaneous	1,878	1,992	1,885	1229	1,005	797	717	283
TOTAL	$21,759	$22,336	$19,751	$8705	$14,533	$13,697	$10,779	$3696

a Included in miscellaneous chemical products. Source: Department of Commerce

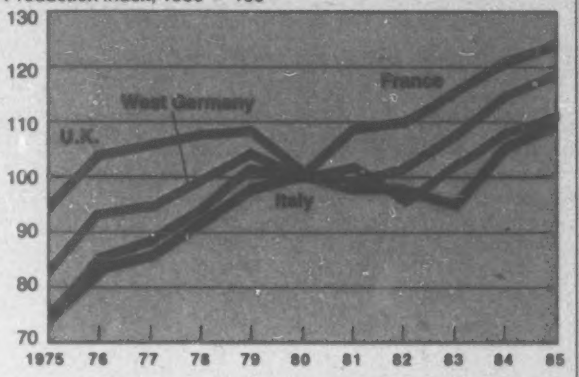
5 Foreign Chemical Industries—Western Europe

European chemical companies had another good year in 1985. West Germany's Bayer retained its position as top in total sales. BASF moved into the number two slot past Hoechst, which now stands at number three.

Profit margins improved for just about every company. Laporte Industries achieved a creditable 10%. Ciba-Geigy and Fisons earned about 8% on sales. Montedison experienced the biggest turnaround, netting a profit for the first time in a decade.

The changing value of the U.S. dollar is causing concern to European business executives. In 1985 as a whole, the dollar gained in strength against West European currencies. But about midyear a change set in, and the dollar began to weaken. The trend is continuing. As a result, European chemical producers face stiffer price competition from their U.S. counterparts.

Gains continue for chemical production



CHEMICAL INDUSTRY TRENDS: Output, prices generally higher as employment holds steady

$ Billions (U.S.)	1985	1984	1983	1982	1981
WEST GERMANY					
Sales	$ 50.5	$ 49.5	$ 49.7	$ 48.5	$ 51.6
Exports	26.1	25.1	24.0	22.9	23.8
Imports	15.0	14.0	13.6	13.0	13.3
Capital spending	2.4	2.2	2.7	2.8	3.1
Production index[a]	111.1	108.8	103.4	96.4	101.6
Price index[a]	121.6	118.1	113.9	113.7	108.7
Employees (thousands)	557	550	549	559	548
FRANCE[b]					
Sales	$ 32.3	$ 30.9	$ 30.1	$ 30.4	$ 33.4
Exports	12.8	12.2	11.5	11.2	11.9
Imports	10.0	9.2	8.9	9.1	9.2
Capital spending	1.2	1.1	1.0	1.1	1.2
Production index[a]	124.4	121.2	114.9	110.2	108.8
Price index[a]	160.0	153.1	139.9	128.2	114.2
Employees (thousands)	276	279	282	286	289
U.K.[b]					
Sales	$ 26.3	$ 25.2	$ 25.6	$ 28.2	$ 37.6
Exports	12.1	11.0	10.5	11.5	12.3
Imports	9.2	8.8	8.1	8.2	7.9
Capital spending	1.7	1.4	1.4	1.9	2.5
Production index[a]	119.4	114.9	108.7	100.8	98.7
Price index[a]	131.6	125.1	119.1	113.5	106.3
Employees (thousands)	326	329	330	338	395
ITALY					
Sales	$ 24.4	$ 23.6	$ 22.9	$ 22.7	$ 24.1
Exports	6.6	6.2	5.7	5.0	5.6
Imports	9.3	8.6	7.9	7.4	7.8
Capital spending	0.9	0.9	1.1	1.1	1.1
Production index[a]	110.0	106.2	100.0	98.3	98.1
Price index[a]	159.7	148.2	134.9	124.1	111.9
Employees (thousands)	233	241	251	260	271
SPAIN[b,c]					
Sales	$ 15.9	$ 15.2	$ 14.2	$ 15.2	$ 15.7
Exports	2.9	2.7	2.2	2.2	2.3
Imports	3.1	3.0	2.8	2.9	3.1
Capital spending	0.3	0.2	0.3	0.4	0.4
Production index[a]	113.9	111.0	104.5	100.0	98.3
Price index[a]	176.7	163.6	147.4	131.0	116.9
Employees (thousands)	240	241	242	243	244

$ Billions (U.S.)	1985	1984	1983	1982	1981
BELGIUM[b,c,d]					
Sales	$ 14.1	$ 13.6	$ 13.2	$ 14.1	$ 15.3
Exports[d]	9.5	9.1	8.8	8.9	9.2
Imports[d]	6.9	6.6	6.3	6.3	6.4
Capital spending	0.4	0.4	0.4	0.3	0.4
Production index[a]	117.3	113.3	107.3	103.1	101.1
Price index[a]	145.0	139.9	133.7	126.0	110.7
Employees (thousands)	90	89	88	88	88
NETHERLANDS					
Sales	$ 13.9	$ 13.6	$ 13.1	$ 12.5	$ 13.6
Exports	12.9	12.5	12.0	11.3	11.9
Imports	8.0	7.2	6.8	6.7	7.1
Capital spending	0.7	0.8	0.7	0.6	0.6
Production index[a]	124.0	122.0	111.0	100.0	97.7
Price index[a]	120.0	116.0	115.0	114.0	114.4
Employees (thousands)	89	89	88	90	91
SWITZERLAND[b]					
Sales	$ 6.7	$ 6.5	$ 6.7	$ 6.6	$ 6.7
Exports	5.7	5.4	5.5	5.4	5.4
Imports	3.6	3.4	3.3	3.3	3.3
Production index[a]	122.9	115.7	109.6	103.0	104.2
Price index[a]	113.8	109.1	106.4	106.8	104.9
Employees (thousands)	65	65	68	na	63
SWEDEN					
Sales	$ 4.2	$ 4.1	$ 3.9	$ 4.0	$ 4.1
Exports	1.9	1.8	1.8	1.6	1.6
Imports	2.7	2.5	2.7	2.6	2.5
Capital spending	0.3	0.3	0.3	0.3	0.3
Production index[a]	116.2	114.6	113.2	104.8	109.4
Price index[a]	155.5	147.0	135.5	120.4	108.8
Employees (thousands)	44	44	43	44	41
NORWAY					
Sales	$ 2.0	$ 2.1	$ 2.1	$ 2.0	$ 1.9
Exports	1.2	1.2	1.1	1.0	1.5
Imports	1.1	1.0	0.9	0.9	1.0
Capital spending	0.1	0.1	0.1	0.1	0.1
Production index[a]	120.0	121.0	110.0	100.6	101.7
Price index[a]	132.6	126.1	123.6	117.9	112.5
Employees (thousands)	16	16	17	18	17

a 1980 = 100. b Excludes fibers. c Includes rubber and plastics processing. d Includes Luxembourg for exports and imports. Sources: National agencies and European Council of Chemical Manufacturers' Federations (CEFIC)

MAN-MADE FIBERS: Production of noncellulosics expands but cellulosics stagnate

Millions of lb	1985		1984		1983		1982		1981		Change, 1983–84	
	Non-cellulosics[a]	Cellulosics	Non-cellulosics[b]	Cellulosics	Non-cellulosics[b]	Cellulosics	Non-cellulosics[b]	Cellulosics	Non-cellulosics[b]	Cellulosics	Non-cellulosics	Cellulosics
West Germany	1753	372	1696	359	1654	334	1511	315	1735	322	3%	4%
Italy	1454	68	1324[a]	68	1166[a]	65	1091[a]	102	1115[a]	133	10	0
Spain	633	80	578	73	539	70	507	95	526	111	10	10
U.K.	545[c]	208[d]	559[c]	305[d]	541[c]	330[d]	506[c]	263[d]	612[c]	298[d]	−3	−32
France	437	44	452	61	437	83	435	100	444	119	−3	−28
Benelux countries	364	95	206	94	189	90	198	124	229	144	77	1
Switzerland	226	0	218	0	204	0	183	0	197	0	4	—
Ireland	140	0	130	0	118	0	114	0	111	0	8	—
Portugal	129	1	106	2	95	1	99	3	83	7	22	−50
Austria	63	265	53	268	53	251	51	251	53	257	19	−1

a Includes polypropylene. b Excludes polypropylene. c Includes cellulose acetate filament. d Excludes cellulose acetate filament. Source: Comité International de la Rayonne et des Fibres Synthétiques

PRODUCTION: Nearly equally split between increases and decreases

Millions of lb	1985	1984	1983	1982	Change 1984–85
FRANCE					
Sulfuric acid	9433	9898	9024	8858	−5%
Hydrochloric acid	1446	1686	1483	1514	−14
Chlorine	3060	3103	2872	2759	−1
Sodium hydroxide	3196	3274	3064	2939	−2
Ammonia	4422	5170	4312	4180	−14
Benzene	1399	1343	1373	1133	4
Toluene	89	87	90	69	2
Xylenes	277	188	199	113	47
Ethylene	4749	4581	4563	4112	4
Propylene	2730	2652	2455	2277	3
Butadiene	634	667	620	569	−5
Formaldehyde	203	210	208	175	−3
Methanol	na	697	761	753	—
Polyethylene	2047	2045	2070	1938	0
Polypropylene	933	871	842	692	7
Polystyrene	1074	1060	1056	972	1
Polyvinyl chloride	1804	1737	1796	1729	4
Synthetic rubber	1199	1218	1125	1045	−2
Phosphate fertilizers (P_2O_5)	1340	1495	1577	2447	−10
ITALY					
Sulfuric acid	9596	9370	9071	8818	2%
Nitric acid	2575	2420	2261	2247	6
Phosphoric acid	889	996	999	970	−12
Chlorine	2021	2095	1974	1701	−4
Sodium hydroxide	2257	2359	2219	1999	−4
Ammonia	3249	3233	2494	2804	0
Benzene	1078	1179	1160	841	−9
Toluene	766	688	658	580	11
Xylenes	919	871	804	594	6
Ethylene	na	2504	2337	1923	—
Propylene	na	1244	1143	981	—
Butadiene	na	399	380	345	—
Phthalic anhydride	na	213	298	298	—
Formaldehyde	303	325	312	275	−7
Acetic acid	132	140	237	342	−6
Carbon black	403	380	339	334	6
Polyethylene	1410	1602	1564	1167	−12
Polystyrene	708	695	725	674	2
Polyvinyl chloride	1357	1493	1391	1302	−9
Synthetic rubber	na	514	504	475	—
Nitrogen fertilizers (N)	7040	7134	6003	5738	−1

a Manufacturers' sales. b From petroleum refining only. Sources: Government agencies for each country

Millions of lb	1985	1984	1983	1982	Change 1984–85
U.K.					
Sulfuric acid	5556	5829	5692	5692	−5%
Hydrochloric acid[a]	337	345	286	260	−2
Phosphoric acid	826	896	981	897	−8
Chlorine	2269	2156	1980	1935	5
Benzene	1837	1660	1597	1253	11
Ethylene	3182	2913	2540	2454	9
Propylene	2141	2147	1719	1695	0
Butadiene	655	570	523	503	15
Acetone	323	355	268	298	−9
Formaldehyde	272	228	226	236	19
Phenol	259	406	315	308	−36
Polyethylene	999	893	898	937	12
Polypropylene	592	568	506	487	4
Polyvinyl chloride	389	379	420	387	3
Synthetic rubber	593	635	571	537	−7
WEST GERMANY					
Sulfuric acid	7371	8002	8009	8334	−8%
Hydrochloric acid	2079	2104	1980	1865	−1
Nitric acid	6361	6284	5778	5040	−1
Chlorine	7686	7536	6900	6253	2
Sodium hydroxide	7581	7408	6830	6318	2
Sodium carbonate	3098	3000	2679	2432	3
Sodium sulfate	306	281	275	472	9
Ammonia	5036	5183	4495	4145	−3
Benzene	2723[b]	2734[b]	2939	2256	0
Toluene	860	816	691	590	5
Xylenes	1089	1003	1127	1012	9
Ethylene	6661	7093	6980	5808	−6
Propylene	3665	3969	3793	3259	−8
Butadiene	1851	1661	1580	1275	11
Ethylene oxide	1073	1044	993	886	3
Ethylene glycol	504	509	450	404	−1
Propylene glycol	371	372	351	279	0
n-Butanol	604	589	562	508	3
Acetaldehyde	726	737	647	571	−1
Acetic acid	655	668	590	562	−2
Ethanol	170	120	171	220	42
Formaldehyde	1253	1283	1175	1070	−2
Methanol	1302	1504	1470	1559	−13
Phthalic anhydride	378	453	429	439	−17
Polyethylene	2725	2882	2996	2473	−5
Polyvinyl chloride	2658	2490	2398	1902	7
Synthetic rubber	1007	988	951	868	2
Nitrogen fertilizers (N)	1826	1843	1642	1464	−1
Phosphate fertilizers (P_2O_5)	394	473	552	595	−17

COMPANY RESULTS: Profitability up more often than not, as are capital and R&D outlays

$ Millions	Net sales	Net income	Profit margin	Capital spending	R&D spending	Employees (thousands)
Bayer (West Germany)						
1985	$15,621.1	$488.4	3.1%	$700.0	$725.9	176.1
1984	15,098.9	411.9	2.7	646.3	686.3	174.8
1983	14,641.6	295.7	2.0	734.1	664.3	174.8
1982	14,335.0	26.3	0.2	846.6	637.9	179.4
BASF (West Germany)						
1985	$15,094.2	$339.5	2.2%	$950.3	$488.1	130.2
1984	14,175.4	314.0	2.2	719.6	435.8	115.8
1983	13,769.0	202.7	1.5	639.2	466.3	114.1
1982	13,368.7	113.2	0.8	824.3	483.1	115.9
Hoechst (West Germany)						
1985	$14,531.3	$499.3	3.4%	$804.4	$708.5	180.6
1984	14,546.3	474.4	3.3	724.9	637.9	177.9
1983	14,583.9	356.5	2.4	733.3	634.1	179.8
1982	14,397.5	130.5	0.9	850.6	642.4	182.2
Imperial Chemical Industries (U.K.)						
1985	$13,910.5	$716.0[a]	5.1%	$822.3	$452.7	118.6
1984	13,247.3	808.8[b]	6.1	589.6	399.7	115.6
1983	12,528.1	602.4[c]	4.8	547.8	418.8	117.9
1982	12,886.2	253.9	2.0	511.4	427.3	123.8
Ciba-Geigy (Switzerland)						
1985	$7,406.9	$598.4	8.1%	$493.1	$679.7	81.0
1984	7,435.7	505.1	6.8	428.5	619.6	81.4
1983	7,019.5	369.5	5.3	395.2	594.3	79.2
1982	6,802.0	306.4	4.5	427.6	578.8	79.4
Montedison (Italy)						
1985	$7,403.4	$127.3[d]	1.7%	$345.7	$157.2	69.7
1984	7,047.2	(14.8)[e,f]	—	279.5	142.3	71.2
1983	7,017.8	(207.4)[e,g]	—	295.6	171.2	72.3
1982	6,665.9	(529.9)[e,h]	—	324.5	170.7	84.2
DSM (Netherlands)						
1985	$7,267.8	$146.1[i]	2.0%	$297.3	$57.2	26.6
1984	7,018.8	179.8[j]	2.6	285.7	54.5	27.2
1983	6,929.8	80.2[k]	1.2	230.9	61.4	27.9
1982	6,806.1	(52.2)[e,l]	—	165.5	63.7	28.6
Rhône-Poulenc (France)						
1985	$6,240.5	$257.1	4.1%	$460.5	$317.6	78.0
1984	5,858.4	227.6	3.9	395.2	281.7	80.0
1983	5,658.4	12.9	0.2	365.4	286.0	80.8
1982	5,661.5	(128.5)[e]	—	329.7	267.6	81.8
Akzo (Netherlands)						
1985	$5,424.7	$275.1[m]	5.1%	$303.6	$218.4	65.0
1984	5,146.4	252.0[n]	4.9	244.2	198.8	66.1
1983	5,292.8	189.2[o]	3.6	219.3	217.5	66.3
1982	5,301.2	84.9[p]	1.6	273.4	323.2	73.7
Norsk Hydro (Norway)						
1985	$4,874.8	$241.9	5.0%	$736.9	$44.4	26.4
1984	4,357.5	247.2	5.7	596.4	29.5	19.8
1983	4,077.9	147.7	3.6	593.0	29.0	18.8
1982	3,185.9	85.4	2.7	509.3	na	19.6
Solvay (Belgium)						
1985	$3,796.6	$187.6[q]	4.9%	$235.5	$131.8	44.5
1984	3,871.5	200.2[r]	5.2	179.9	126.7	43.5
1983	3,887.0	128.8[s]	3.3	155.3	127.1	44.2
1982	3,891.3	47.6[t]	1.2	153.8	131.1	45.4
Hoffmann-La Roche (Switzerland)						
1985	$3,632.3	$183.6	5.1%	$160.8	$486.3	45.5
1984	3,519.1	161.8	4.6	194.0	486.2	46.2
1983	3,576.2	156.4	4.4	216.1	473.5	45.9
1982	3,499.2	138.5	4.0	346.7	453.5	46.5
Sandoz (Switzerland)						
1985	$3,436.2	$215.0	6.3%	$169.9	$294.7	40.2
1984	3,163.4	174.9	5.5	129.4	269.8	38.0
1983	3,117.1	152.4	4.9	128.6	261.9	38.1
1982	2,981.8	134.5	4.5	124.6	244.8	37.3
BOC International (U.K.)						
1985	$2,465.5	$142.2[u]	5.8%	$313.2	$46.3	36.9
1984	2,811.5	106.0[v]	3.8	322.6	56.6	38.7
1983	2,582.1	83.2[w]	3.2	468.1	40.8	39.1
1982	2,686.9	113.0[x]	4.2	388.3	43.6	38.4
Fisons (U.K.)						
1985	$838.8	$73.4[y]	8.8%	$7.4	$22.7	9.0
1984	738.8	50.8[z]	6.9	9.4	20.1	8.6
1983	554.5	38.1[aa]	6.9	4.7	21.2	7.5
1982	613.8	25.4	4.1	3.2	29.4	7.5
Albright & Wilson (U.K.)						
1985	$833.2	$27.9[bb]	3.3%	$55.8	na	6.8
1984	761.2	29.3[cc]	3.8	46.8	na	6.3
1983	865.3	31.9[dd]	3.7	37.2	na	6.3
1982	929.6	12.4[ee]	1.3	33.6	na	7.2
UCB Belgium						
1985	$524.3	$16.0[ff]	3.0%	$22.9	$19.5	6.4
1984	534.8	22.9[gg]	4.3	21.6	18.4	6.5
1983	572.4	22.0[hh]	3.8	23.5	17.6	6.4
1982	606.6	9.4	1.6	20.0	17.2	6.7
Laporte Industries (U.K.)						
1985	$463.9	$46.3[ii]	10.0%	$35.9	na	3.6
1984	475.4	37.3	7.8	13.5	na	3.6
1983	440.4	27.7[jj]	6.3	7.7	na	3.5
1982	425.5	19.3[kk]	4.6	21.7	na	3.5

a Excludes nonrecurring loss of $51.9 million. b Excludes nonrecurring loss of $26.7 million. c Excludes nonrecurring loss of $28.8 million. d Excludes nonrecurring minority interests' loss of $68.1 million. e Deficit. f Excludes nonrecurring gain of $17.6 million and minority interests' loss of $50.1 million. g Excludes nonrecurring minority interests' loss of $4.6 million. h Excludes nonrecurring loss of $105.7 million and minority interests' profit of $0.7 million. i Excludes nonrecurring loss of $13.0 million and minority interests' loss of $12.0 million. j Excludes nonrecurring loss of $17.6 million and minority interests' loss of $17.5 million. k Excludes nonrecurring gain of $6.3 million and minority interests' loss of $29.1 million. l Excludes minority interests' loss of $18.1 million. m Excludes extraordinary gain of $0.6 million and minority interests' loss of $22.0 million. n Excludes nonrecurring loss of $10.6 million and minority interests' loss of $6.7 million. o Excludes nonrecurring loss of $36.0 million and minority interests' loss of $3.0 million. p Excludes nonrecurring loss of $18.4 million and minority interests' loss of $4.8 million. q Excludes nonrecurring loss of $50.5 million. r Excludes nonrecurring loss of $60.9 million. s Excludes nonrecurring loss of $25.7 million. t Excludes nonrecurring gain of $9.2 million. u Excludes nonrecurring loss of $9.2 million. v Excludes extraordinary gain of $16.7 million. w Excludes nonrecurring loss of $19.4 million. x Excludes nonrecurring gain of $10.7 million. y Excludes nonrecurring loss of $4.8 million. z Excludes nonrecurring loss of $5.6 million. aa Excludes nonrecurring loss of $10.0 million. bb Excludes nonrecurring loss of $3.7 million. cc Excludes nonrecurring loss of $0.3 million. dd Excludes nonrecurring loss of $1.5 million. ee Excludes nonrecurring loss of $17.2 million. ff Excludes extraordinary gain of $7.2 million. gg Excludes extraordinary gain of $0.7 million. hh Excludes nonrecurring loss of $3.0 million. ii Excludes extraordinary gain of $4.2 million. jj Excludes nonrecurring loss of $3.5 million. kk Excludes nonrecurring gain of $138.4 million. na = not available.

NOTE ON CURRENCY CONVERSION

For monetary statistics in this section, European currencies were converted to U.S. dollars by the following conversion rates:

	$1.00 (U.S.) is equivalent to:									
	Belgium	France	Italy	Netherlands	Norway	Spain	Sweden	Switzerland	U.K.	West Germany
1985	59.38 francs	8.99 francs	1909 lire	3.32 guilders	8.60 crowns	170.04 pesetas	8.60 crowns	2.46 francs	0.771 pound	2.94 marks
1984	57.78 francs	8.74 francs	1757 lire	3.21 guilders	8.16 crowns	160.76 pesetas	8.27 crowns	2.35 francs	0.748 pound	2.85 marks
1983	51.13 francs	7.62 francs	1519 lire	2.85 guilders	7.30 crowns	143.43 pesetas	7.67 crowns	2.10 francs	0.659 pound	2.55 marks
1982	45.69 francs	6.57 francs	1353 lire	2.67 guilders	6.45 crowns	109.86 pesetas	6.28 crowns	2.03 francs	0.571 pound	2.43 marks
1981	37.13 francs	5.44 francs	1137 lire	2.50 guilders	5.74 crowns	92.31 pesetas	5.06 crowns	1.96 francs	0.493 pound	2.26 marks

Source: International Monetary Fund

Japanese chemical companies, like many of their counterparts throughout the world, are cutting back on basic petrochemical operations and seeking profitable niches in upgraded, higher-value products.

Production growth was lower in the chemical industry in 1985 than for all manufacturing industries as a whole. Output of petrochemicals and plastics, for instance, grew an anemic 0.4% and 0.2%, respectively, last year.

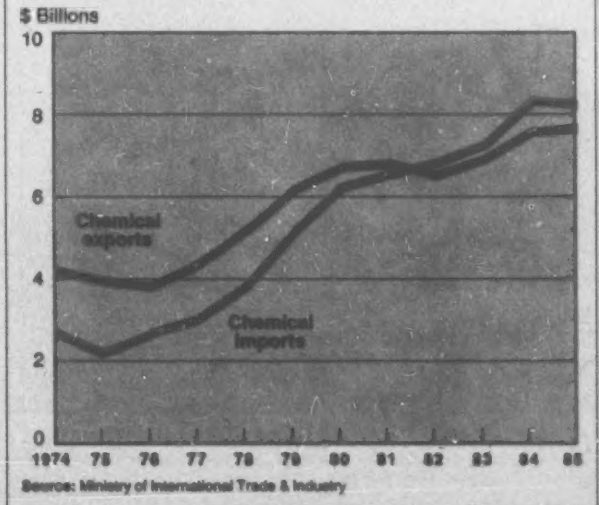
On the financial side, the more diversified companies, which depend less on basic petrochemicals, generally fared best. Profit margins, as a rule, were higher for them as profits in Japan's petrochemical industry deteriorated last year.

PRODUCTION: Growth lags for chemicals

Production index, 1980 = 100	1985	1984	1983	1982	Change 1984–85
All manufacturing	122.1	116.7	104.9	101.4	5%
All chemicals	121.8	117.9	108.8	102.5	3
Inorganic chemicals and pigments	110.3	105.9	101.7	95.7	4
Alkalies and chlorine	95.9	95.2	90.7	90.1	1
Organic chemicals	95.6	96.9	86.6	86.5	−1
Petrochemicals	114.1	113.7	98.5	92.4	0
Aromatics	112.0	106.6	96.1	90.7	5
Cyclic intermediates and dyes	117.0	116.9	105.1	97.5	0
Plastics	119.9	119.7	105.2	96.5	0
Synthetic fibers	100.6	100.2	97.1	96.0	0
Synthetic rubber	105.8	106.1	91.8	85.1	−0
Fertilizer	76.8	79.8	77.4	80.2	−3
Textile materials	115.6	108.0	96.6	97.0	6
Medicinals and drugs	143.0	135.0	126.9	116.8	6

Source: Ministry of International Trade & Industry

Chemical trade remains in the red



Source: Ministry of International Trade & Industry

PRODUCTION: Sprinkled with minus signs

Thousands of metric tons unless otherwise indicated	1985	1984	1983	1982	Change 1984–85
INORGANIC CHEMICALS					
Ammonia	1981	2029	1881	2010	−2%
Ammonium chloride	373	387	435	486	−4
Ammonium sulfate	1837	1829	1722	1689	0
Calcium carbide	441	478	476	483	−8
Calcium superphosphate	529	559	559	527	−5
Carbon black	632	606	568	504	4
Chlorine, liquid	926	897	818	794	3
Hydrochloric acid	549	521	511	551	5
Nitrogen, millions of cu m	6220	5896	5369	5236	5
Oxygen, millions of cu m	7388	7216	6434	6493	2
Sodium carbonate	1057	1036	1103	1162	2
Sodium hydroxide	3075	3085	2863	2792	0
Sodium silicate	594	596	588	650	0
Sulfuric acid	6580	6458	6662	6530	2
Titanium dioxide	217	205	196	184	6
ORGANIC CHEMICALS					
Acetaldehyde	271	297	255	279	−9
Acetic acid	344	350	328	353	−2
Acetone	237	246	247	229	−4
Acrylonitrile	541	523	459	489	3
Benzene[a]	2084	2013	1750	1888	4
Butadiene	639	627	556	522	2
Butanol	258	243	229	228	6
Caprolactam	455	436	395	388	4
Cyclohexane	524	492	454	426	7
Dioctyl phthalate	241	249	231	221	−3
Ethylene	4224	4390	3688	3950	−4
Ethylene dichloride	1901	1939	1736	1548	−2
Ethylene glycol	440	429	357	385	3
Ethylene oxide	554	533	468	471	4
Methanol	254	280	373	625	−9
Octanol	230	246	219	226	−7
Phenol	262	272	271	211	−4
Phthalic anhydride[a]	162	156	161	159	4
Propylene	2980	2981	2658	2565	0
Propylene glycol	219	205	194	185	7
Styrene	1418	1423	1167	1086	0
Terephthalic acid	854	742	702	649	15
Toluene	803	784	831	803	2
Toluene diisocyanate	84	76	74	67	11
Urea	929	1120	980	1187	−17
Xylene	1523	1401	1264	1225	9
PLASTICS					
Phenolic resins	325	334	325	281	−3
Polyethylene	2027	2251	2027	1674	−10
Polypropylene	1304	1271	1304	941	3
Polystyrene	1599	1503	1599	1190	6
Polyvinyl chloride	1550	1504	1550	1216	3
SYNTHETIC RUBBER	1158	1160	1158	931	0

a Petroleum-based product only. Source: Ministry of International Trade & Industry

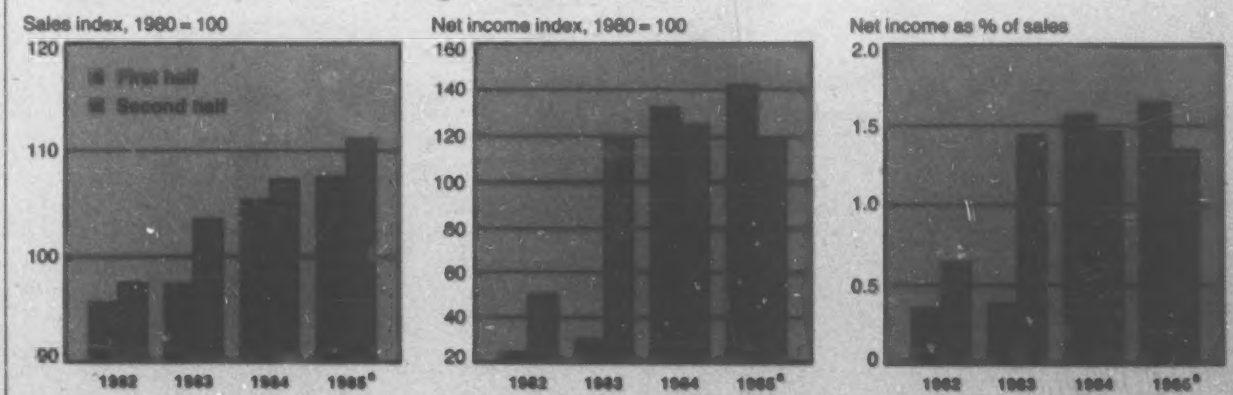
COMPANY RESULTS: Generally little change in profitability or employment last year

$ Millions	Sales	Net income	Profit margin	Total assets	Employees (thousands)
Mitsubishi Chemical Industries[a]					
1985	$3963	$33.1	0.8%	$4016	8.2
1984	3271	7.0	0.2	3211	8.3
1983	3155	0.6	0.0	3479	8.5
1982	3142	(36.5)[b]	—	3326	8.4
Sumitomo Chemical[c]					
1985	$3219	$38.9	1.2%	$3277	7.1
1984	2876	58.4	2.0	2818	6.9
1983	2783	17.3	0.6	2775	7.9
1982	2681	(30.6)[b]	—	2510	9.1
Asahi Chemical Industry[d]					
1985	$3910	$73.3	1.9%	$3661	15.9
1984	3129	57.3	1.8	3027	15.9
1983	2985	47.0	1.6	3022	16.3
1982	2670	45.8	1.7	2809	14.0
Toray Industries[d]					
1985	$3177	$78.2	2.5%	$3326	12.6
1984	2563	61.4	2.4	2663	13.2
1983	2588	66.0	2.6	2576	14.1
1982	2398	59.4	2.5	2385	13.9
Mitsui Toatsu Chemicals[d]					
1985	$2102	$14.7	0.7%	$2242	5.4
1984	1672	8.6	0.5	1810	5.3
1983	1695	(14.7)[b]	—	1794	5.4
1982	1783	44.9	2.5	1790	5.7

$ Millions	Sales	Net income	Profit margin	Total assets	Employees (thousands)
Teijin[d]					
1985	$2102	$70.9	3.4%	$2210	7.0
1984	1766	57.3	3.2	1842	7.2
1983	1797	51.4	2.9	1846	7.1
1982	1751	30.1	1.7	1953	7.1
Showa Denko[c]					
1985	$2066	$20.1	1.0%	$2738	4.6
1984	1683	0.5	0.0	2069	4.6
1983	1500	(6.6)[b]	—	2086	5.0
1982	1539	(2.9)[b]	—	2004	5.3
Mitsubishi Petrochemical[c]					
1985	$2139	$22.4	1.1%	$1939	2.4
1984	1592	43.3	2.7	1553	2.3
1983	1547	2.0	0.1	1644	2.5
1982	1508	(37.4)[b]	—	1767	3.5
Dainippon Ink & Chemicals[d]					
1985	$2102	$26.4	1.3%	$1722	6.2
1984	1642	20.1	1.2	1449	6.0
1983	1681	19.0	1.1	1472	6.0
1982	1609	17.9	1.1	1426	5.9
Sekisui Chemical[d]					
1985	$1769	$22.5	1.3%	$1439	6.2
1984	1415	16.9	1.2	1184	6.1
1983	1369	15.7	1.2	1199	6.1
1982	1294	9.0	0.7	1238	6.2

a Fiscal year ends Jan. 31. b Deficit. c Fiscal year ends Dec. 31. d Fiscal year ends March 31; 1985 data for these companies are based on actual results for the first half of the year and estimates for the second half. **Note:** Monetary statistics are converted from yen to U.S. dollars on the basis of $1.00 equals, 1985, 204.6 Y; 1984, 244.6 Y; 1983, 236.7 Y; 1982, 235.8 Y. Year-to-year changes in sales, net income, and assets are affected by these fluctuations in the currency exchange rate. **Source:** Toyo Keizai Shinposha

Chemical firms' profits hit a snag in 1985's second half



a Data for second half of 1985 are estimated. **Note:** Based on results of 10 leading Japanese chemical companies: Mitsubishi Chemical Industries, Sumitomo Chemical, Asahi Chemical Industry, Toray Industries, Mitsui Toatsu Chemicals, Teijin, Showa Denko, Mitsubishi Petrochemical, Dainippon Ink & Chemicals, and Sekisui Chemical. For most, but not all, of these companies, the fiscal year ends March 31. **Source:** Toyo Keizai Shinposha

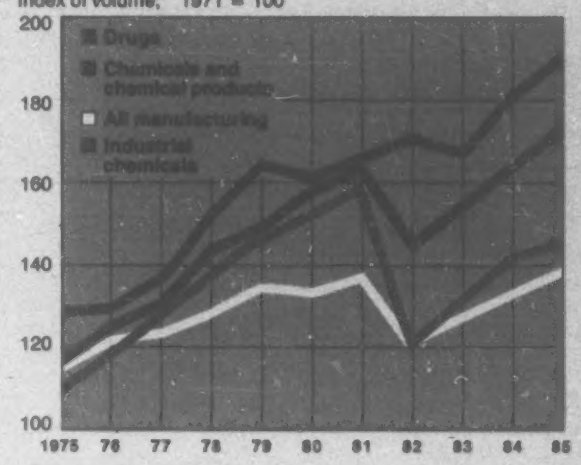
Supported by a full year of output from some new world-scale plants, ethylene—and some of its derivatives—led the chemical pack in production gains last year. Weaknesses, however, showed up in some fertilizer products and in pulp and paper chemicals.

Weak selling prices continued to weigh on several basic chemicals. Prices of all commodities rose 3% last year, but chemical prices increased less than half as much. Prices of organic chemicals were down 6%, and olefin prices alone slumped 12%.

This price pressure made profits tough to come by. But oil and gas are likely to be less expensive this year. And Canada's dollar remains weak against the U.S. dollar. This will make Canadian chemicals very competitive in the U.S.

Note on currency conversion: Monetary statistics in this section have been converted from Canadian dollars to U.S. dollars on the basis of $1.00 U.S. equals, 1985, $0.734 Canadian; 1984, $0.765 Canadian; 1983, $0.804 Canadian; 1982, $0.814 Canadian; 1981, $0.843 Canadian.

Output climbs, with drugs setting pace



a Gross domestic product. Source: Statistics Canada

COMPANY RESULTS: Profits remain low

$ Millions (U.S.)	Sales	Net income[a]	Profit margin	Capital expenditures	Employees (thousands)
C-I-L Inc.					
1985	$927.8	$28.6	3.1%	$86.6	6.3
1984	899.6	29.1	3.2	90.5	6.3
1983	895.5	19.2	2.1	87.6	6.7
1982	862.7	12.4	1.4	69.6	6.9
Celanese Canada					
1985	$272.8	$ 9.3	3.4%	$11.7	2.1
1984	296.4	6.0	2.0	10.2	2.8
1983	304.6	7.6	2.5	9.7	3.4
1982	248.7	(4.2)[b]	—	44.0	3.4
Du Pont Canada					
1985	$870.7	$15.1	1.7%	$52.4	4.9
1984	895.5	31.5	3.5	34.6	5.0
1983	897.6	28.3	3.2	20.3	5.0
1982	797.7	(6.0)[b]	—	20.5	5.4
Polysar					
1985[c]	$1371.1	$ 0.1	—	$ 40.1	6.7
1984	1083.4	27.5	2.5%	43.8	6.0
1983	1074.9	7.0	0.7	155.9	6.0
1982	1081.6	(24.8)[b]	—	168.5	6.6
Union Carbide Canada					
1985[d]	$368.0	$ 0.2	0.1%	$21.4	3.8
1984	528.9	4.4	0.8	19.3	4.1
1983	552.4	(1.1)[b]	—	43.5	4.2
1982	562.7	(14.6)[b]	—	55.0[e]	4.5

a Excludes extraordinary gains and losses. b Deficit. c Acquired interest in Fairoser formerly held by Du Pont Canada and Union Carbide Canada. d Reflects divestment of polyethylene business. e Excludes $41.4 million (U.S.) addition to Prentiss, Alta., ethylene glycol plant transferred to another Union Carbide subsidiary.

PRODUCTION: Farm chemicals do poorly

Thousands of metric tons	1985	1984	1983	1982	Change 1984–85
INORGANIC CHEMICALS					
Ammonia	3620	3493	2888	2509	4%
Ammonium nitrate	1054	1035	934	1018	2
Ammonium phosphate	1301	1383	1259	888	−6
Chlorine	1424	1424	1385	1233	0
Hydrochloric acid	158	161	170	135	−2
Nitric acid	1128	1100	1061	977	3
Phosphoric acid, 100% P_2O_5	627	691	656	503	−9
Sodium chlorate	336	313	294	264	7
Sodium hydroxide	1589	1574	1528	1367	1
Sulfuric acid	3890	4043	3686	3131	−4
ORGANIC CHEMICALS					
Acetone	23	25	25	23	−8
Benzene	688	549	580	504	25
Butadiene	132	127	133	118	4
Ethylene	1744	1464	1196	1013	19
Formaldehyde	na	97	90	70	na
Methanol	na	1872	1671	na	na
Propylene	648	656	715	618	−1
Toluene	473	395	411	470	20
Urea	2033	2162	1445	1231	−6
Xylenes	415	406	426	431	2
PLASTICS					
Polyesters, unsaturated	36	34	26	27	7
Polyethylene, high density	229	227	211	194	1
Polyethylene, low density	733	529	412	376	39
Polystyrene[a]	178	171	na	126	4
Polyvinyl chloride	280[b]	252	243	194	11

a Includes acrylonitrile-butadiene-styrene resins in 1984 and 1985. b C&EN estimate. na = not available. Source: Statistics Canada

SHIPMENTS: A weak year for industrial chemicals

$ Millions (U.S.)	1985	1984	1983	1982	1981	Change 1984–85
All manufacturing	$179,177	$174,373	$163,192	$152,551	$160,747	3%
Chemicals and chemical products	12,898	12,821	12,613	11,573	11,118	1
Industrial chemicals, inorganic	2,639	2,683	2,556	2,343	1,848	−2
Industrial chemicals, organic	2,833	2,966	3,102	2,947	2,699	−4
Plastics and synthetic resins	1,317	1,331	1,302	1,126	1,275	−1
Pharmaceuticals and medicinals	1,536	1,468	1,336	1,187	1,119	5
Adhesives	98	94	92	64	na	4
Paint and varnish	881	815	784	667	742	8
Soaps and cleansers	1,028	962	940	902	860	7
Toilet preparations	626	614	597	542	497	2
Agricultural chemicals	291	272	287	158	na	7
Printing ink	184	183	172	149	179	1
Miscellaneous	1,292	1,258	1,274	1,317	1,526	3
Synthetic fibers	563	568	607	485	na	−1

na = not available. Source: Statistics Canada

CHEMICAL IMPORTS: Nearly unchanged

$ Millions (U.S.)	1985	1984	1983	Change 1984–85
Inorganic chemicals	$ 374	$ 381	$ 330	−2%
Organic chemicals	1107	1120	1019	−1
Fertilizers and fertilizer materials	152	158	148	−4
Synthetic and reclaimed rubber	160	158	129	1
Plastic materials	651	644	604	1
Plastic film and sheet	278	253	215	10
Other plastic shapes and forms	214	202	146	6
Dyes, except dyeing intermediates	49	56	62	−12
Pigments, lakes, and toners	78	77	65	1
Paints and related products	127	113	89	12
Other chemical products	807	824	724	−2
TOTAL	**$3997**	**$3986**	**$3531**	**0%**
Imports from U.S.	**$3034**	**$3114**	**$2754**	**−3%**
U.S. share, %	**75%**	**78%**	**78%**	

Source: Statistics Canada

CHEMICAL EXPORTS: Slightly lower

$ Millions (U.S.)	1985	1984	1983	Change 1984–85
Chemical elements	$ 158	$ 174	$ 150	−9%
Other inorganic chemicals	828	797	631	4
Organic chemicals	995	992	966	0
Fertilizers and fertilizer materials	946	1171	933	−19
Synthetic rubber and plastic materials	587	481	419	22
Plastics, basic shapes and forms	238	203	159	17
Other chemical products	236	236	229	0
TOTAL	**$3988**	**$4054**	**$3487**	**−2%**
Exports to U.S.	**$2669**	**$2663**	**$2286**	**0%**
U.S. share, %	**67%**	**66%**	**66%**	—

Source: Statistics Canada

TRADE BALANCE: Surplus slips a little

$ Billions (U.S.)	1985	1984	1983	1982
Total exports	$85.3	$83.8	$71.1	$66.6
Total imports	77.1	73.2	60.8	55.3
Trade balance	8.2	10.6	10.3	11.3

Chemical trade is just about in balance

$ Millions (U.S.)	1985	1984	1983	1982
Chemical exports	$3988	$4054	$3487	$3284
Chemical imports	3997	3986	3531	2919
Chemical trade balance	−9	68	−44	365

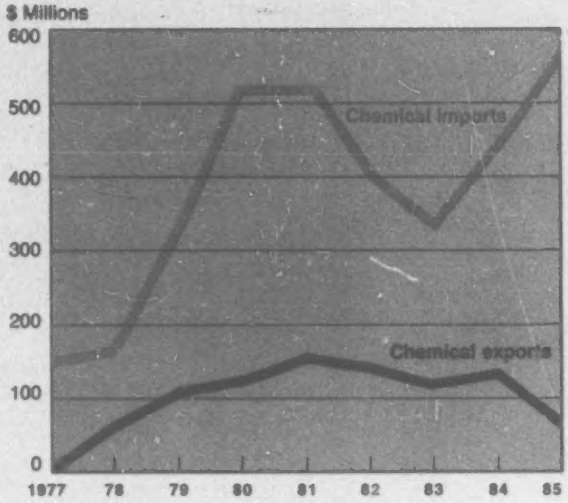
Source: Statistics Canada

PRICES: For chemicals overall, little change

Price index, 1981 = 100	1985	1984	1983	Change 1984–85
All commodities	118.6	115.4	110.4	3%
Chemicals and chemical products	114.5	113.1	108.8	1
Inorganic industrial chemicals	114.5	112.5	107.9	2
Sulfuric acid	121.7	119.3	117.0	2
Chlorine	130.1	124.6	116.4	4
Organic industrial chemicals	94.5	100.3	98.9	−6
Benzene-toluene-xylene	94.0	89.6	92.4	5
Olefins	83.5	95.4	98.8	−12
Synthetic resins	109.4	111.4	106.8	−2
Polyethylene[a]	90.8	99.0	93.6	−8
Polystyrene	93.6	101.5	102.4	−8
Thermosets	115.1	113.2	107.5	2
Synthetic fibers	101.2	101.5	99.1	0
Pharmaceuticals	141.5	131.5	122.1	8
Paint and varnish	121.6	116.3	113.6	5
Soaps and cleansers	119.1	115.2	111.5	3
Toilet preparations	140.9	135.3	121.3	4
Agricultural chemicals	111.9	107.6	105.9	4
Pigments, lakes, and toners	115.0	112.2	106.0	2
Fertilizers, mixed	100.4	102.0	97.9	−2
Inks	110.4	108.8	109.7	1

a Includes both high and low density. Source: Statistics Canada

Trade deficit surges as exports plummet



Note: Trade in primary petrochemicals only; does not include secondary chemicals.
Source: Petróleos Mexicanos

DOMESTIC SALES: Up strongly for some

Thousands of metric tons[a]	1985	1984	1983	1982	Change 1984–85
Acetaldehyde	199	212	200	156	−6.8%
Acrylonitrile	96	84	86	71	13.6
Ammonia, anhydrous	1804	1670	1455	1308	8.0
Benzene	17	12	11	13	42.6
Butadiene	110	106	84	66	3.5
Cyclohexane	62	50	51	50	24.3
Dodecylbenzene	100	101	107	111	−1.4
Ethylene oxide	118	112	105	78	5.4
Hexane	48	50	47	54	−4.9
Isopropyl alcohol	61	58	54	47	5.4
Methanol	176	162	140	129	9.0
Polyethylene, high density	134	136	120	120	−1.1
Polyethylene, low density	266	222	251	261	19.9
Styrene	140	125	116	118	12.3
Sulfur	457	455	319	365	0.3
Toluene	97	85	81	86	14.6
Vinyl chloride	275	259	206	139	6.1
o-Xylene	38	32	33	27	20.9
p-Xylene	268	263	131	187	1.9

a Domestic sales by Petróleos Mexicanos (Pemex) of primary petrochemicals. Source: Pemex

CHEMICAL IMPORTS: Many show sharp gains

Thousands of metric tons[a]	1985	1984	1983	1982	Change 1984–85
Acetaldehyde	70	70	42	13	0.0%
Acrylonitrile	50	34	28	17	46.4
Benzene	0	0	0	12	—
Butadiene	97	67	45	50	44.8
Cyclohexane	33	26	3	13	29.7
Dichloroethane	0	57	25	0	—
Dodecylbenzene	39	49	55	47	−19.9
Ethylbenzene	6	16	6	16	−61.6
Ethylene	0	0	0	31	—
Ethylene oxide	48	11	0	0	347.8
Isopropyl alcohol	50	44	25	31	15.3
Perchloroethylene	14	15	9	12	−7.1
Polyethylene, high density	42	19	49	17	124.7
Polyethylene, low density	127	63	88	106	103.5
Propylene	26	26	17	22	−0.4
Propylene tetramer	19	12	6	15	58.7
Styrene	112	93	66	61	20.1
Toluene	43	37	0	12	16.4
Vinyl chloride	162	109	75	71	48.8
o-Xylene	9	0	7	10	—
p-Xylene	179	119	25	131	51.2

a Imports by Petróleos Mexicanos (Pemex) of primary petrochemicals. Source: Pemex

PRODUCTION: More up than down

Thousands of metric tons[a]	1985	1984	1983	1982	Change 1984–85
Acetaldehyde	145	147	153	149	−1.4%
Acrylonitrile	49	49	55	53	0
Ammonia, anhydrous	2261	2156	2355	2469	4.9
Benzene	178	156	139	96	14.1
Butadiene	18	20	18	15	−9.5
Cyclohexane	32	30	49	35	4.7
Cumene	39	33	37	20	18.8
Dichloroethane	193	220	265	201	−12.
Dodecylbenzene	61	51	57	62	20.3
Ethane	1905	1574	1638	1550	21.1
Ethylbenzene	46	31	24	23	48.4
Ethylene	670	643	645	396	4.3
Ethylene oxide	71	97	112	79	−27.1
Hexane	98	95	64	76	3.5
Hydrochloric acid	63	77	79	47	−18.1
Isopropyl alcohol	14	14	12	11	2.6
Methanol	192	197	206	191	−2.4
Nitrogen	46	47	45	39	−1.3
Oxygen	211	200	214	208	5.3
Polyethylene, high density	67	76	82	78	−11.1
Polyethylene, low density	160	134	88	93	19.8
Propylene	207	208	191	158	−0.7
Propylene tetramer	31	35	30	38	−11.5
Styrene	33	30	24	29	9.2
Sulfur, recovered	475	461	377	425	3.0
Toluene	220	216	223	133	1.9
Vinyl chloride	108	132	134	79	−18.1
m- and *p*-Xylene	247	225	197	99	9.6
o-Xylene	44	43	39	16	4.0

a Production of Petróleos Mexicanos (Pemex) of primary petrochemicals. Source: Pemex

In 1985, economic growth slowed somewhat in East Europe and the Soviet Union. Overall industrial output for the region rose 3.9%, short of the goal of 4.1% and down from growth rates of 4.3% in 1983 and 1984.

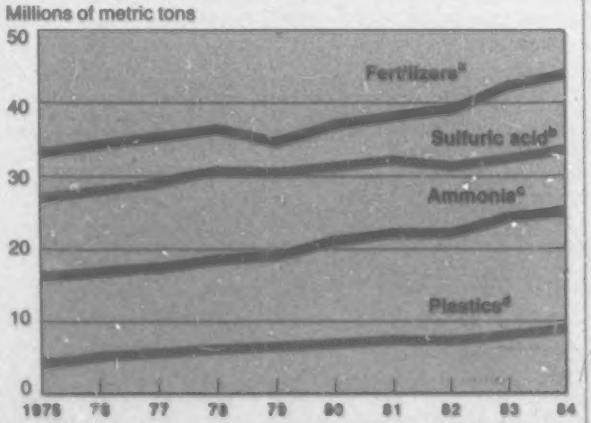
Chemical industry growth also slowed in 1985, hindered like that for other industries by an unusually harsh winter and resulting fuel and energy shortages. Soviet chemical output rose 5%, with mineral fertilizers up 8%, plastics 4%, and pesticides, sodium hydroxide, and sulfuric acid up 3%. Soviet output of fertilizers, plastics, and man-made fibers failed to meet targets.

MAN-MADE FIBERS: Moderate growth in output for most East European countries

Production, thousands of metric tons	1984	1983	1982	1981	Change 1983–84
NONCELLULOSIC FIBERS[a]					
Bulgaria	62	60	52	56	3%
Czechoslovakia	105	105	102	90	0
East Germany	144	144	134	134	0
Hungary	25	21	20	21	18
Poland	154	148	128	119	5
Romania	166	155	151	154	7
U.S.S.R.	644	622	594	573	4
TOTAL	1300	1254	1182	1148	4%
CELLULOSIC FIBERS					
Bulgaria	41	39	38	39	5%
Czechoslovakia	59	58	55	54	2
East Germany	170	165	162	169	3
Hungary	7	6	8	8	9
Poland	76	69	64	64	9
Romania	60	60	58	65	0
U.S.S.R.	652	645	635	646	1
TOTAL	1064	1042	1020	1044	2%

a Excludes olefins and textile glass. Source: Textile Economics Bureau

Eastern Europe has been boosting chemical output during the 1980s



a As N, P_2O_5, and K_2O. b 100% H_2SO_4. c Nitrogen content. d Including resins for man-made fibers in U.S.S.R. Note: Data for U.S.S.R., Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania. Sources: Central Intelligence Agency, Department of Agriculture, C&EN estimates

PRODUCTION GROWTH: Rise continues

% annual change in gross output	1985	1984	1983	1982	1981
U.S.S.R. and East Europe					
All industry	3.9%	4.3%	4.3%	2.4%	2.2%
Bulgaria					
All industry	4.0	4.2	4.3	4.6	5.4
Chemicals	3.4	8.2	5.9	6.6	4.0
Czechoslovakia					
All industry	3.4	4.0	2.8	1.1	2.1
Chemicals	3.9	4.5	3.5	1.1	1.7
East Germany					
All industry[a]	4.4	4.2	4.1	3.1	4.7
Chemicals	na	4.3	2.9	4.8	2.7
Hungary					
All industry	1.0	3.2	1.2	2.5	2.4
Chemicals[b]	na	4.0	1.5	1.5	2.3
Poland					
All industry	3.8	5.2	6.4	−2.1	−10.8
Chemicals	2.7	5.0	8.2	0.1	−11.4
Romania					
All industry	4.9	6.7	4.7	1.1	2.6
Chemicals	na	8.2	5.5	1.5	4.0
U.S.S.R.					
All industry[c]	3.9	4.1	4.2	2.9	3.4
Chemicals[c]	5.0	5.0	6.0	3.0	5.5
All industry[d]	na	3.8[e]	3.8	2.4	2.3
Chemicals[d]	na	4.1[e]	6.7	1.5	4.0

a Industrial commodity production. b For state and cooperative industry only. c Figures based on official Soviet statistics. d Figures based on Central Intelligence Agency estimates, giving lower results because of postulated upward bias in official figures. e Preliminary figure. na = not available. Sources: United Nations Economic Commission for Europe, Foreign Broadcast Information Service, and Wharton Econometric Forecasting Associates, based on official national statistics; Central Intelligence Agency

AGRICULTURAL CHEMICALS: Fertilizer supplies generally lower outside U.S.S.R.

Thousands of metric tons	1985	1984	1983	1982	1981
Bulgaria					
Fertilizer supply[a]	950[b]	964	1,009	1,038	1,044
Pesticide supply[c]	na	35.6	33.9	40.4	48.6
Czechoslovakia					
Fertilizer supply[a]	1,734[b]	1,759	1,776	1,741	1,720
East Germany					
Fertilizer supply[a]	1,590[b]	1,566	1,451	1,408	1,726
Pesticide supply[c]	na	26.0	26.0	26.7	27.0
Hungary					
Fertilizer supply[a]	1,338	1,524	1,586	1,528	1,485
Poland					
Fertilizer supply[a]	3,270[b]	3,424	3,182	3,346	3,499
Pesticide supply[c]	12.3	11.1	14.7	16.3	12.4
Romania					
Fertilizer supply[a]	1,135[b]	1,168	1,157	1,077	1,083
U.S.S.R.					
Fertilizer supply[a]	25,400	23,080	22,977	20,152	19,176
Nitrogen[a]	11,430[b]	10,279	10,302	0,038	8,383
Phosphate[a,d]	7,240[b]	6,625	6,465	6,115	5,879
Potassium[a]	6,720[b]	6,167	6,201	4,991	4,905
Pesticide supply[e]	595	576	557	533	504

a Nutrient content basis, as N, P_2O_5, or K_2O. b Estimated. c On basis of active substance. d Includes ground phosphate rock. e On conventional weight basis. na = not available. Sources: Department of Agriculture and Foreign Broadcast Information Service, based on official national statistics

PRODUCTION: U.S.S.R. accounts for the bulk of Eastern Europe's chemicals

Thousands of metric tons, unless otherwise noted	1985[a]	1984	1983	1982	1981
U.S.S.R.					
Sulfuric acid, 100%	26,000	25,338	24,714	23,801	24,095
Mineral fertilizers[b]	33,200	30,808	29,733	26,738	25,999
Nitrogen[b]	14,490	13,328	13,014	11,593	10,705
Phosphate[b,c]	8,170	7,705	7,417	7,057	6,836
Potassium[b]	10,530	9,776	9,294	8,079	8,449
Synthetic ammonia[d]	na	17,445	16,904	14,605	14,718
Plastics[e]	5,000	4,819	4,419	4,058	4,089
Sodium hydroxide, 100%	3,100	2,972	2,853	2,783	2,757
Synthetic rubber[f]	na	1,850	1,812	1,795	1,860
Pesticides[g]	595	577	557	533	504
Rubber tires[h]	65,200	63,700	62,000	61,700	60,500
(thousands of units)					
BULGARIA					
Sulfuric acid, 100%	na	908	861	916	920
Mineral fertilizers[b]	na	690	687	698	710
Nitrogen[b]	na	479	483	459	453
Phosphate[b]	172	211	204	239	258
Synthetic ammonia[d]	na	1,138	1,124	1,033	1,023
Plastics	na	418	398	337	290
Sodium hydroxide, 100%	na	163	147	155	151
Synthetic rubber	na	26	25	25	30
Pesticides[i]	na	20	21	20	20
CZECHOSLOVAKIA					
Sulfuric acid, 100%	na	1,240	1,244	1,252	1,315
Mineral fertilizers[b]	na	1,190	1,175	1,166	1,139
Nitrogen[b]	582	576	591	568	539
Phosphate[b,c]	na	398	378	387	394
Potassium[b,g]	na	216	206	211	206
Synthetic ammonia[d]	na	na	809	726	711
Plastics	1,100	1,039	1,006	956	913
Sodium hydroxide, 100%	na	325	330	324	330
Synthetic rubber	na	71	67	66	63
Pesticides[i]	na	na	16	16	16
EAST GERMANY					
Sulfuric acid, 100%	na	884	926	920	948
Mineral fertilizers[b]	na	4,733	4,714	4,669	4,787
Nitrogen[b]	1,078	959	968	948	967
Phosphate[b,c]	na	308	315	286	360
Potassium[b]	na	3,465	3,431	3,434	3,460
Synthetic ammonia[d]	na	na	1,210	1,167	1,203
Plastics	na	1,085	1,045	990	998
Sodium hydroxide, 100%	na	695	687	695	631
Synthetic rubber	na	152	155	155	155
Pesticides[i]	na	na	54	53	53
Rubber tires[h]	na	7,764	7,380	7,051	7,026
(thousands of units)					
HUNGARY					
Sulfuric acid, 100%	na	550	606	571	573
Mineral fertilizers[b]	na	1,103	1,110	1,071	1,112
Nitrogen[b]	na	675	684	660	684
Phosphate[b]	na	288	282	269	276
Potassium[b,j]	na	139	140	142	152
Synthetic ammonia[d]	na	na	812	791	819
Plastics	na	383	345	326	314
Sodium hydroxide, 100%[k]	na	194	192	178	180
Pesticides[i]	36	36	36	28	29
POLAND					
Sulfuric acid, 100%	na	2,770	2,786	2,676	2,776
Mineral fertilizers[b]	2,270	2,356	2,323	2,284	2,241
Nitrogen[b]	1,254	1,369	1,341	1,298	1,274
Phosphate[b]	889	869	872	868	866
Potassium[b,j]	127	118	111	118	101
Synthetic ammonia[d]	na	na	1,430	1,384	1,465
Plastics	na	593	535	451	476
Sodium hydroxide, 100%	na	379	392	363	400
Synthetic rubber	126	119	120	100	111
Pesticides[i]	na	na	9	9	8
Rubber tires[h]	8,541	8,104	6,695	5,322	6,134
(thousands of units)					
ROMANIA					
Sulfuric acid, 100%	na	1,915	1,941	1,600	1,814
Mineral fertilizers[b]	3,096	3,073[f]	2,913	2,692	2,640
Nitrogen[b]	na	2,212[f]	2,091	2,008	1,822
Synthetic ammonia[d]	na	na	2,723	2,583	2,383
Plastics	628	655	633	591	584
Sodium hydroxide, 100%	na	805	745	760	767
Synthetic rubber	156	159	147	160	146
Pesticides[i]	na	53	48	45	43

a Approximate figures or estimates. b Nutrient content basis, as N, P_2O_5, or K_2O. c Including production of ground phosphate rock for direct applications and phosphate animal feeds. d Nitrogen content. e Including resins for man-made fibers. f Estimated. g On conventional weight basis. h For all motor vehicle tires, excluding aircraft and bicycle tires. i On basis of active substance. j Imported potash added to domestically produced nitrogen and phosphate to form multinutrient fertilizer. k Including regenerated NaOH. na = not available. **Sources:** Central Intelligence Agency, Department of Agriculture, Foreign Broadcast Information Service, Commerce Department, and Wharton Econometric Forecasting Associates, based on official national statistics

SOVIET FOREIGN TRADE: Overall surplus drops sharply

$ Millions	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975
Exports[a]	$87,895[b]	$91,492	$91,652	$87,168	$79,377	$76,437	$64,912	$52,435	$45,227	$37,269	$33,407
Imports[a]	83,819[b]	80,353	80,440	77,847	73,158	68,473	57,958	50,798	40,926	38,212	37,070
Trade balance	4,076[b]	11,139	11,212	9,321	6,219	7,964	6,954	1,637	4,301	−943	−3,663
Chemical exports[a]	na	na	2,422	2,309	2,380	2,139	1,606	1,284	1,063	939	1,027
Chemical imports[a]	na	na	4,070	3,886	4,031	3,732	2,803	2,188	1,850	1,668	1,747
Chemical trade balance	na	na	−1,648	−1,577	−1,651	−1,593	−1,197	−904	−787	−729	−720

a Free on board. b Approximate values. na = not available. **Sources:** Central Intelligence Agency, Wharton Econometric Forecasting Associates, based on official Soviet statistics and exchange rates

Foreign Chemical Industries—Western Pacific 5

KOREA

INDUSTRY TRENDS: Growth moderates

Index, 1980 = 100	1985	1984	1983	1982	Change 1984–85
Chemicals, petroleum, coal, rubber, and plastic products					
Production	146.6	140.7	123.7	105.9	4%
Shipments	138.1	132.6	119.5	102.4	4
Inventories	132.4	125.2	119.5	115.4	6
Industrial chemicals					
Production	129.4	126.4	116.0	101.8	2
Shipments	141.5	134.4	124.5	108.2	5
Inventories	137.0	117.3	114.2	121.1	17
Other chemical products					
Production	171.7	160.8	141.7	122.5	7
Shipments	168.6	158.7	139.2	119.4	6
Inventories	183.8	159.3	141.6	118.5	15
Rubber products					
Production	158.1	158.4	120.3	99.2	0
Shipments	158.4	158.2	120.1	98.3	0
Inventories	139.4	138.2	99.8	87.2	1
Plastic products					
Production	153.6	145.3	124.2	92.9	6
Shipments	154.7	146.1	123.6	92.6	6
Inventories	130.6	139.9	132.0	121.9	−7
All manufacturing					
Production	167.1	160.6	139.0	119.4	4
Shipments	160.6	153.6	135.8	116.2	5
Inventories	150.3	138.0	126.0	126.5	9

Source: Bureau of Statistics of the Korean Economic Planning Board

FOREIGN TRADE: Chemical deficit stable

$ Millions	1985	1984	1983	1982
Exports[a]	$30,283	$29,245	$24,445	$21,853
Imports[b]	31,136	30,631	26,192	24,251
Trade balance	−853	−1,386	−1,747	−2,398
Chemical exports	936	845	677	670
Chemical imports	2,789	2,709	2,242	2,051
Chemical trade balance	−1,853	−1,864	−1,565	−1,381

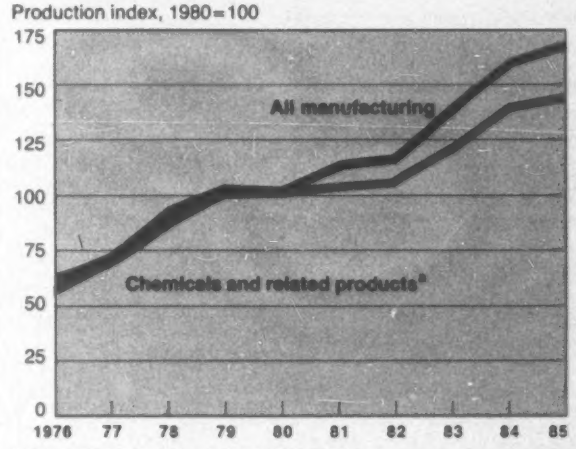
a Free on board. b Includes cost, insurance, freight. **Source:** Korean Office of Customs Administration

PRODUCTION: Down for some ag chemicals

Thousands of metric tons	1985[a]	1984	1983	1982	Change 1984–85
Sulfuric acid	2028	1975	1610	1596	3%
Complex fertilizers	1944	1861	1614	1667	4
Ammonia	536	565	523	661	−5
Urea fertilizers	839	858	737	788	−2
Ethylene	562	526	491	374	7
Polyethylene	353	317	279	218	11
Polyester fibers	291	265	217	189	10
Sodium carbonate	251	248	231	186	1
Sodium hydroxide	229	215	202	166	6
Benzene	216	171	159	120	26
Insecticides	84	110	87	58	−23
Synthetic detergents	68	62	57	52	10

a Preliminary figures. **Source:** Bureau of Statistics of the Korean Economic Planning Board

After two strong years, growth in production slowed in 1985



a Includes petroleum, coal, rubber, and plastic products.
Source: Bureau of Statistics of Korean Economic Planning Board

AUSTRALIA

PRODUCTION: Higher for most chemicals

Thousands of metric tons	1985[a]	1984[a]	1983[a]	1982[a]	Change 1984–85
Chemicals and acids					
Hydrochloric acid, 100%	58	57	60	55	2%
Nitric acid, 100%	197	189	189	180	4
Sulfuric acid, 100%	1774	1726	1782	2027	3
Ammonium sulfate	242	217	200	207	12
Superphosphate[b]	2582	2663	2986	3568	−3
Plastics and resins	na	822	720	801	na
Synthetic detergents	226	228	220	211	−1
Unsupported plastics film, sheeting	157	139	na	119	13
Polyethylene[c]	118	107	na	82	10
Polyvinyl chloride[d]	14	14	17	18	2

a Years ending June 30. b Includes double and triple superphosphates and ammonium phosphate expressed in terms of single phosphate (22% P_2O_5 equivalent). c Low and high density. d Including copolymers. na = not available. **Source:** Australian Bureau of Statistics

FOREIGN TRADE: Chemical deficit widens

$ Millions	1985[a]	1984[a]	1983[a]	1982[a]
Exports[b,c]	$23,215	$21,842	$20,184	$20,639
Imports[d]	22,593	21,374	20,004	24,365
Trade balance	622	468	180	−3,726
Chemical exports[b,c]	426	455	431	430
Medicinal products	95	108	102	95
Chemical imports[d]	1,986	1,959	1,671	1,955
Organic chemicals	523	554	441	530
Resins, plastic materials	442	441	343	460
Medicinal products	229	201	182	166
Chemical trade balance	−1,560	−1,504	−1,240	−1,525

a Years ending June 30. b Free on board. c Includes re-exports. d Values for customs purposes, free-on-board basis. **Source:** Australian Bureau of Statistics

CHINA

PRODUCTION: Fibers continue strong growth but agricultural chemicals slump

Thousands of metric tons, unless otherwise noted	1985	1984	1983	1982	Change 1984–85
Fertilizer[a]	13,350	14,602	13,789	12,781	−9%
Nitrogen (N)	na	12,210	11,094	10,219	na
Phosphate (P_2O_5)[b]	na	2,360	2,666	2,537	na
Potash (K_2O)	na	32	29	25	na
Sulfuric acid, 100%	6,690	8,172	8,696	8,175	−18
Sodium hydroxide	2,347	2,222	2,123	2,073	6
Sodium carbonate	2,000	1,880	1,793	1,735	6
Calcium carbide	na	1,846	1,808	1,675	na

Thousands of metric tons, unless otherwise noted	1985	1984	1983	1982	Change 1984–85
Plastics	1,208	1,160	1,121	1003	4%
Man-made fibers	945	735	541	517	29
Synthetic detergents	na	810	677	569	na
Ethylene	651	648	654	565	0
Pesticides	205	299	331	457	−31
Pharmaceuticals	57	52	48	42	10
Synthetic rubber	na	174	169	136	na
Rubber tires[c]	18,527	15,345	12,710	8640	21

a Nutrient content. b Including production of ground phosphate rock for direct application and phosphate animal feeds. c In thousands of units, not including wheelbarrow and bicycle tires. na = not available. Sources: State Statistical Bureau of the People's Republic of China, Chinese Ministry of Chemical Industry, Central Intelligence Agency

CHEMICAL IMPORTS: Up sharply

$ Millions[a]	1984	1983	1982	Change 1983–84
Fertilizers[b]	$ 700	$ 569	$ 622	23%
Plastic materials, resins	1133	575	634	97
Chemical elements and compounds	589	576	521	2
Dyeing, tanning, and coloring materials	86	117	141	−26
Medicinal products	62	43	34	44
Essential oils, perfume, and cleansing materials	51	40	22	28
Mineral tar and crude chemicals[c]	5	7	1	−23
Explosives and pyrotechnic products	2	1	1	143
Other chemical products	302	308	195	−2
TOTAL	$2931	$2235	$2170	31%

a Free on board. b Manufactured. c From coal, oil, and natural gas. Source: Central Intelligence Agency, estimated from data reported by China's trade partners

CHEMICAL EXPORTS: Moderate growth

$ Millions[a]	1984	1983	1982	Change 1983–84
Chemical elements and compounds	$ 608	$ 541	$ 581	12%
Medicinal products	248	237	224	5
Explosives and pyrotechnic products	122	112	110	9
Essential oils, perfume, and cleansing materials	120	110	98	9
Dyeing, tanning, and coloring materials	89	81	71	10
Plastic materials, resins	57	54	43	5
Mineral tar and crude chemicals[b]	14	16	31	−9
Fertilizers[c]	1	3	3	−69
Other chemical products	138	134	137	3
TOTAL	$1398	$1289	$1296	8%

a Free on board. b From coal, oil, and natural gas. c Manufactured. Source: Central Intelligence Agency, estimated from data reported by China's trade partners

TAIWAN

INDUSTRY TRENDS: Growth slows

Industrial production indexes, 1981 = 100	1985	1984	1983	1982	Change 1984–85
All manufacturing	132.9	132.0	117.0	101.3	1%
Chemical materials	149.0	139.6	115.4	99.6	7
Basic chemicals	125.7	118.6	107.1	99.7	6
Petrochemicals	154.7	144.8	114.3	95.3	7
Fertilizers	65.6	75.2	74.0	72.8	−13
Synthetic fibers	146.7	136.6	117.8	104.1	7
Plastics and resins	164.6	153.1	123.8	105.0	8
Chemical products	147.1	141.8	125.2	116.4	4

Source: Taiwan Ministry of Economic Affairs

FOREIGN TRADE: Deficit down for chemicals

$ Millions	1985	1984	1983	1982
Exports[a]	$30,717	$30,456	$25,123	$22,204
Imports[b]	20,107	21,959	20,287	18,888
Trade balance	10,610	8,497	4,836	3,316
Chemical exports[a,c]	1,341	1,244	1,041	1,012
Chemical imports[b,c]	2,965	3,203	2,814	2,312
Chemical trade balance	−1,624	−1,959	−1,773	−1,299

a Free on board. b Includes cost, insurance, and freight. c For chemicals and chemical products. Sources: Taiwan Council for Economic Planning & Development, Taiwan Ministry of Finance, C&EN estimates

PRODUCTION: Some gains, some losses

Thousands of metric tons, unless otherwise noted	1985	1984	1983	1982	Change 1984–85
Man-made fibers	1028	970	840	730	6%
Sulfuric acid	733	762	678	685	−4
Polyvinyl chloride	633	634	522	459	0
Ethylene	792	660	499	452	20
Vinyl chloride	511	492	458	434	4
Ammonium sulfate	507	434	381	373	17
Ammonia, anhydrous	252	327	378	386	−23
Sodium hydroxide	387	351	295	359	10
Xylene[a]	310	334	275	230	−7
Compound fertilizer	249	301	275	247	−17
Propylene	415	341	250	225	22
Hydrochloric acid	228	241	212	191	−5
Benzene[a]	322	281	182	130	14
Urea	139	179	171	175	−22
Calcium superphosphate	132	177	159	160	−25
Ethylene glycol	199	189	151	120	5
Oxygen[b]	347	198	125	164	75
Toluene[a]	172	195	115	113	−12
Paints	130	123	108	97	6

a Millions of liters. b Millions of cubic meters. Source: Taiwan Council for Economic Planning & Development